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IN THE  
**Supreme Court of the United States**

OCTOBER TERM, 1923, No. 120.

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THOMSON SPOT WELDER COMPANY,  
PETITIONER,

*vs.*

FORD MOTOR COMPANY, DEFENDANT-  
RESPONDENT.

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**BRIEF FOR RESPONDENT**

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# SUBJECT-MATTER INDEX.

	Page
Opening Statement. . . . .	1
The Art of Electric Welding. . . . .	8
Thomson Fundamental Patents Nos. 347,140 and 347,141. . . . .	10
Thomson Patent No. 396,015. . . . .	13
Thomson Patent No. 444,928. . . . .	16
Lemp Patent No. 553,923. . . . .	21
Thomson Patent No. 496,019. . . . .	22
Robinson Patent No. 574,942. . . . .	32
Kleinschmidt Patent No. 616,436. . . . .	34
Burton Patent No. 647,694. . . . .	35
Perry Patent No. 670,808. . . . .	37
Parkinson British Patent No. 14,536 of 1894. . . . .	39
de Ferranti British Patent No. 11,921 of 1903. . . . .	40
Benardos German Patent No. 50,909. . . . .	41
Stanley U. S. Patent No. 1,176,614. . . . .	45
Graphic Comparison of Harmatta Disclosure With Prior Art (Folder). . . . .	46
Application of Electric Resistance Welding here in Controversy was Never Patentable to Harmatta. . . . .	47
Process Distinguished from Apparatus. . . . .	49
All of the Process or Method Claims of Harmatta are Anticipated and Void. . . . .	55
Plaintiff's Abortive Efforts to Distinguish be- tween Harmatta's Process and Those of the Prior Art. . . . .	60
Roller Electrodes and Pin Electrodes. . . . .	60
Thickness of Plates or Parts Operated Upon. . . . .	63
Character of Current . . . . .	66
Electrode Materials. . . . .	66
Graphic Comparison of Electrode Materials and Materials Operated Upon of Harmatta with those of Prior Art (Folder). . . . .	67
Materials to be United By Welding. . . . .	68

	Page
Extrusion of Metal .....	72
Because of Breadth of Harmatta Product Claims they are Anticipated by Patents of Robinson, Benardos and Others .....	79
By the Conduct of Its Predecessor, Plaintiff is Estopped to Assert Harmatta's Priority Over Rietzel. . . . .	84
Plaintiff's Conduct Resulted in Securing Monop- oly to Plaintiff of Over Twenty Years Instead of Seventeen Years. . . . .	109
Defendant Practiced Spot Welding Before Issue of Harmatta Patent and During the <i>status</i> <i>quo anti</i> . . . . .	111
The Law of Equitable Estoppel. . . . .	111
The Commissioner of Patents is Regarded as the Representative of the Public. . . . .	116
Rietzel did Actually Electrically Weld Plane- Faced Plates in Spots in 1898. . . . .	123
What Harmatta Thought He Had Invented and What He Sought to Patent. . . . .	129
The Harmatta Patent .....	142
The New Matter Inserted in the Harmatta Patent	144
The Product or Article Claims of the Harmatta Patent are Invalid Because of New Matter Never Sworn to by Harmatta to be of His Invention. . . . .	148
The Product or Article Claimed by Harmatta is Indistinguishable from that Claimed by Riet- zel, and Plaintiff is Estopped to Contend to the Contrary .....	151
The Prior Invention of Sebastian Z. de Ferranti. .	152
The Decision of the Court of Appeals in de Fer- ranti vs. Harmatta .....	164
de Ferranti First Claimed Substance of Issues Involved in de Ferranti vs. Harmatta, Decem- ber 6, 1910 .....	164
The Bearing of Chapman & Chapman vs. Win- troath, 252 U. S., 126, on the Harmatta Patent as a Whole .....	168

	Page
The Prior Suit on the Harmatta Patent Against Barney & Berry, Inc., was Feebly Defended and Ought not be Given But Little, if Any Weight. . . . .	169
Judge Dodge's Decision . . . . .	174
The Decision of the Court of Appeals for the First Circuit. . . . .	176
The Process of Spot Welding, So-Called, of Har- matta is but a Normal and Expected Applica- tion of Electric Resistance Welding and In- volves Nothing Patentable . . . . .	178
The Enormous Commercial Development of Spot Welding is Not Attributable to Harmatta. . . .	183
Spot Welding by Mr. F. P. McBerty in 1901. . . . .	188
Fred P. McBerty . . . . .	195
Major Edward B. Craft . . . . .	204
Jasper W. Powers . . . . .	206
John S. Gilder . . . . .	208
Evrah C. Lipps . . . . .	209
John A. McDonald . . . . .	210
Capt. William E. Smith. . . . .	212
Mr. McElray. . . . .	214
Albertus C. Taylor . . . . .	215
Fred. G. Carter . . . . .	216
William B. Ensor . . . . .	216
John B. Estabrook . . . . .	218
Plaintiff's Unsuccessful Attempts to Answer the McBerty Defense . . . . .	218
Conclusiveness of the Findings of Fact by a Trial Judge. . . . .	229
Supreme Court Cases . . . . .	230
Circuit Court of Appeals Cases. . . . .	231
Sixth Circuit. . . . .	233
Conclusions. . . . .	239

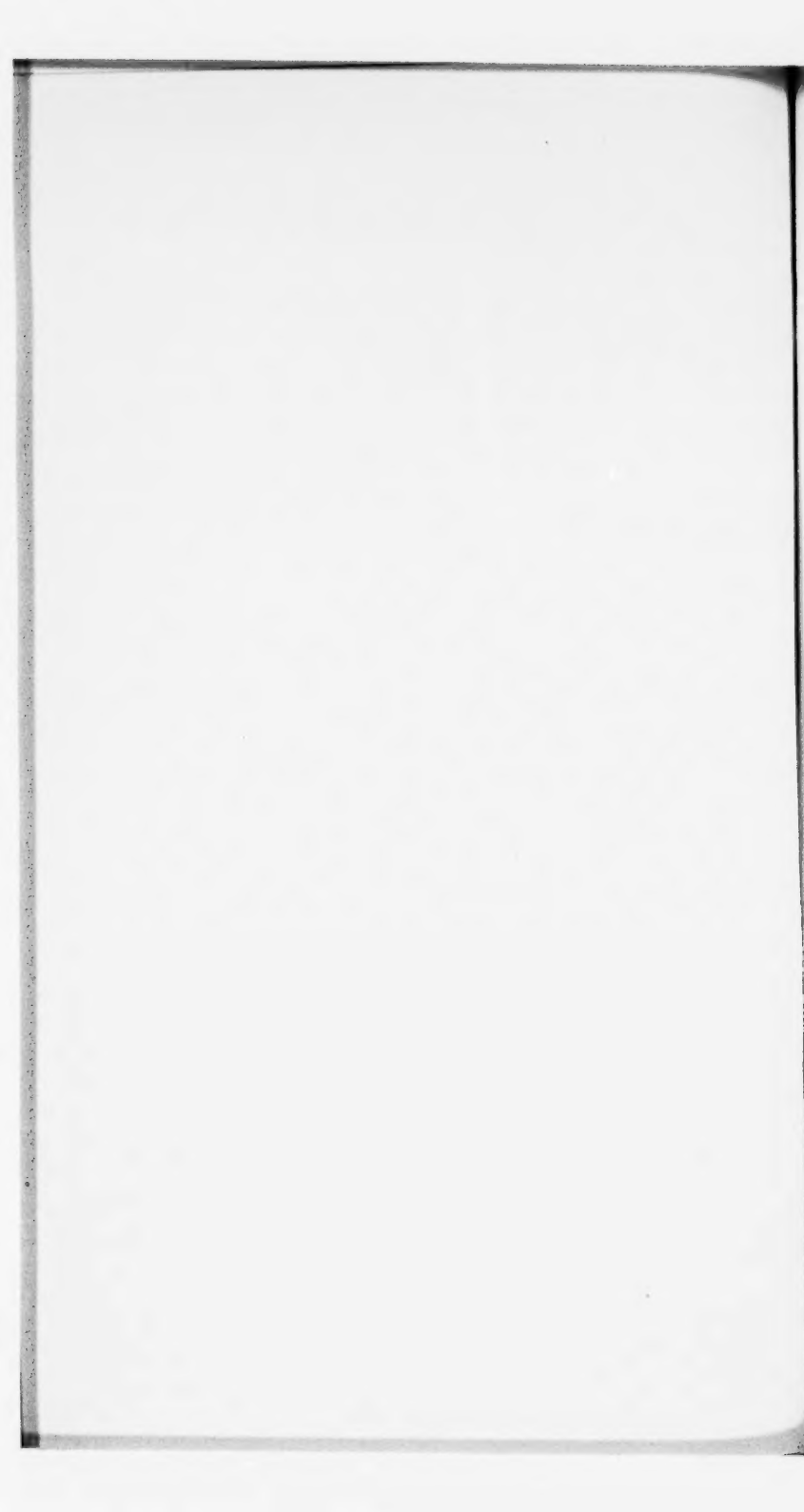
## TABLE OF CASES CITED.

	Page
Adamson vs. Gilliland, 242 U. S., 350.....	230
Aetna Co. vs. Davidson Co., 257 Fed., 68.....	235
American Lava Co. vs. Steward, 155 Fed., 731....	150
Bain vs. White, 256 Fed., 428.....	232
Barber Co. vs. Brown Co., 258 Fed., 1.....	233
Blettner vs. Gill, 251 Fed., 81.....	235
Bromley Co. vs. Stewart, 51 Fed., 912.....	181
Brookheim vs. Greenbaum, 225 Fed., 763.....	231
Brush vs. Condit, 132 U. S., 39.....	189, 227
Burt vs. Coats & Cameron, 47 App. D. C., 185....	159
Carey vs. Donohue, 209 Fed., 328.....	234
Chautauqua Institute vs. Zimmerman, 233 Fed., 371. ....	234
Chapman & Chapman vs. Wintroath, 252 U. S., 126. ....	164, 168
City of Toledo vs. Toledo Co., 259 Fed., 450.....	234
Coffin vs. Ogden, 18 Wall. 120.....	189, 227
Deister Co. vs. Deister Mach. Co., 263 Fed., 706...	235
Diamond Co. vs. Webster Bros., 249 Fed., 155....	238
Dooley vs. Pease, 180 U. S., 126.....	230
Eachus vs. Broomall, 115 O. G., 429.....	150
Egbert vs. Lipman, 104 U. S., 333.....	189, 226
Elliott vs. Peet, 202 Fed., 434.....	232
Elliott & Co. vs. Youngstown Co., 181 Fed., 345....	181
Escanaba Co. vs. Burns, 257 Fed., 898.....	233
Estep vs. Kentland Co., 239 Fed., 617.....	235
Expanded Metal Co. vs. Bradford, 214 U. S., 366..	49
Fed. Co. vs. Pick & Co., 251 Fed., 894.....	236
Ferranti vs. Lindmark, 30 App. D. C., 417.....	159
Fried. Krupp Aktien-Gesellschaft vs. Midvale Steel Co., 191 Fed., 588.....	117
Fuller vs. Reed, 249 Fed., 158.....	231
Grant vs. Raymond, 6 Peters, 217.....	117
Hamlin vs. Grogan, 257 Fed., 59.....	236
Haslem vs. Pittsburgh Glass Co., 68 Fed., 479....	181
Hathaway vs. First Nat. Bank, 134 U. S., 494....	230
Hathaway vs. Ford Motor Co., 264 Fed., 952.....	238

# INDEX—Continued

v

	Page
Jay vs. Weinberg, 250 Fed., 469.....	159
Kephart, <i>Ex Parte</i> , 1903 C. D., 137.....	116
King vs. Weiss Co., 266 Fed., 257.....	233
Lake Erie Co. vs. Schneider, 257 Fed., 675.....	233
Leggat vs. M'Lure, 234 Fed., 620.....	239
Lillie, <i>Ex Parte</i> , 53 O. G., 2041.....	140
McKeithan Co. vs. Fidelity Co., 256 Fed., 428.....	232
Nashville Co. vs. Barnum, 212 Fed., 634.....	231
National Surety Co. vs. Globe Co., 256 Fed., 601..	238
National Tube Co. vs. Spang, 135 Fed., 22.....	181
N. Y. Belting Co. vs. Sibley, 15 Fed., 386.....	117
Nichols vs. Elkins, 225 Fed., 689.....	238
Pierce vs. Dock Co., 265 Fed., 148.....	231
Powder Co. vs. Powder Works, 98 U. S., 126.....	150
Pugh vs. Snodgrass, 209 Fed., 325.....	234
Railroad Supply Co. vs. Hart Co., 222 Fed., 274..	116
Rowntree vs. Sloan, 45 App. D. C., 207.....	164
Steward vs. American Lava Co., 215 U. S., 161....	151
Thomson Electric Weld. Co. vs. Barney and Berry Co., 227 Fed., 428.....	2, 170, 183
Turner vs. Schaeffer, 249 Fed., 654.....	233
Tyng vs. Grinnell, 92 U. S., 467.....	230
Union Mfg. Co. vs. Lounsbury, 24 Fed. Cases 587..	118
U. S. vs. Fidelity Co., 236 U. S., 512.....	230
U. S. vs. Marshall, 210 Fed., 595.....	237
U. S. Mineral Wool Co. vs. Manville Co., 125 Fed., 770.....	189, 228
Virginia Co. vs. Charles, 254 Fed., 379.....	232
Washington Co. vs. Murray, 211 Fed., 440.....	232
Wear vs. Imperial Co., 224 Fed., 60.....	238
Weld vs. McKay, 218 Fed., 807.....	236
Winter vs. Bostwick, 212 Fed., 884.....	235
Winter & Eichberg vs. Latour, 25 App. D. C., 415..	159
Wiscart vs. D'Anchy, 3 How., 320.....	230



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TIF-PETITIONER,

*vs.*

FORD MOTOR COMPANY, DEFENDANT-  
RESPONDENT.

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**BRIEF FOR RESPONDENT**

This is a suit in equity brought by Thomson Spot Welder Company, a Massachusetts corporation, plaintiff-petitioner (hereinafter referred to as plaintiff) against Ford Motor Company, a corporation of Michigan, defendant-respondent (hereinafter referred to as defendant) for the infringement of letters patent No. 1,046,066, granted December 3, 1912 (upon an application filed just nine years earlier, namely, on December 3, 1903), to Johann Harmatta, of the Kingdom of Hungary, assignor to Thomson Electric Welding Company, the predecessor of the plaintiff, for improvements in Electric Welding.

The Harmatta patent has once before been in litigation, namely, in a suit brought March 13, 1913, in the United States District Court, for the District of Massachusetts, by Thomson Electric Welding Company,

et al., against Barney & Berry, Inc. In that suit the patent was held invalid by the District Court, presided over by the Honorable Frederic Dodge, Circuit Judge; but, on appeal, Judge Dodge was reversed and the patent sustained. Both the opinion of Judge Dodge and the opinion of Judge Putnam, speaking for the Circuit Court of Appeals for the First Circuit, are reported in 227 Fed. 428. Barney & Berry, Inc., was only the nominal defendant in that case, the real defendant being The Toledo Electric Welding Company, of Toledo, Ohio, the manufacturer and seller of a machine of whose use by Barney & Berry, Inc., complaint was made.

After the decision of the Court of Appeals of the First Circuit, the present plaintiff, Thomson Spot Welder Company, was organized to carry on the spot welding business of the Thomson Electric Welding Company, and proceeded to attempt to impose upon the manufacturers and users of electric spot welding machines a very onerous licensing scheme, requiring, among other things, the payment of a royalty of \$250, each year, per machine, and also an acknowledgment of the validity of the Harmatta patent.

The manufacture and sale to the public of spot welding machines, by others than Thomson Electric Welding Company, began as early as the year 1908, or more than four years before the Harmatta patent was granted, and as the use of metal as a substitute for wood increased by leaps and bounds, the availability of electric welding for the union of metal sheets and other metal parts became more and more appreciated, until it came to pass that almost every factory contained as a part of its equipment one or more spot welding machines. The attempt, therefore, of the



plaintiff to hold up the users of spot welders under the Harmatta patent raised such a storm of protest throughout the country, that an organization was finally formed called "The Welding Patents Investigating Committee," with a view to determining, first, the true position of Harmatta in the electric welding art, and secondly, to ascertaining whether the suit against Barney & Berry, Inc., had been adequately defended, or only defended in such a partial and half-hearted manner as was thought by the parties would result in the sustaining of the patent. Over four hundred of the makers and users of spot welding machines became contributors to a fund to carry on the work of this committee with the understanding that any contributor might avail himself of the materials of defense which the committee might gather. (See Defendant's Exhibit Bulletin, No. 21, July 17, 1917, offered at page 1001.)

The plaintiff itself realizing the weakness of its position, notwithstanding the adjudication of its patent, for a time adopted the policy of attempting by threats to extend its licensing field and of not risking the bringing of any suit outside of the First Circuit, until it finally discovered that there was such an increasing and general disregard of the patent as to require it to be further litigated, as the only chance of rendering it further profitable. The present suit, instituted December 1, 1917, over two years after the adjudication of the Court of Appeals in the Massachusetts case, represents the first attempt to judicially enforce the patent outside the First Circuit.

Notwithstanding its contribution of funds to the Welding Patents Investigating Committee, for the gathering of materials of defense, the defendant herein

has undertaken, at its own expense and without contribution from the committee or any of its members, to alone bear the whole burden of the defense of this case.

The very large record that is now presented to the Court for consideration represents, in part, defendant's efforts to enlighten the Court and to guide it to a correct conclusion as to the merit, or lack of merit, of Harmatta's contribution to the electric welding art.

It is believed that the record shows, among other things:

(a) That plaintiff's exploitation of the Harmatta patent represents but one effort, among many, on the part of plaintiff and its predecessor, to maintain their dominance in the electric welding art, notwithstanding the expiration of the fundamental patents of Thomson and others, covering generically, that art, as well as the specific application of it now called "spot welding."

(b) That plaintiff's predecessor made a prior notable attempt to control so-called spot welding through a patent granted to it in 1909 as the assignee of one Adolph Rietzel, one of its employees, and then after that patent had been used for over three years as the foundation of a licensing system and as a club to enforce the payment of tribute by users of spot welders, procured through purchase, the Harmatta United States application and transferred to that application all the broad generic claims of the Rietzel patent and took a new patent running in the name of Harmatta, which extended the plaintiff's monopoly seventeen years longer, making it twenty years in all.

(c) That Rietzel in his work conceived and reduced to practice two modifications of spot welding, involving in their practice the same method of operation and resulting in the production of the same article, namely,—

(1) The spot welding of superposed plates, one or both of which were formed with slight projections for localizing the application of pressure and current at separate or isolated spots; and

(2) The spot welding of plane-faced plates by the application of current and pressure at isolated spots by means of pin electrodes.

(d) That when, during the prosecution of the application for the Rietzel patent, the foreign patents of Harmatta were cited in anticipation of Rietzel, the Thomson Company, through the sworn affidavits of Rietzel, represented to the Commissioner of Patents that Rietzel's invention of both the process of spot welding plates having projections and the process of spot welding plane-faced plates antedated the invention of Harmatta as disclosed in said foreign patents.

(e) That, in an interference in the Patent Office that was ultimately declared between the Rietzel patent, and the U. S. application of Harmatta, the Thomson Company again, through sworn affidavits of Rietzel, represented to the Commissioner of Patents that Rietzel was the prior inventor over Harmatta, and, by virtue of such representation, an immediate judgment of priority against Rietzel was averted, and the Rietzel patent was enabled to be further continued to be used, unaffected, as the basis for the Thomson Company's licensing system and as a menace with which to threaten the public into submission to the Rietzel patent.

(f) That by reason of the representations so made to the Commissioner of Patents, as the representative of the general public, the plaintiff, as the successor in interest of the Thomson Electric Welding Company, is precluded and estopped to deny the priority of Rietzel in this suit against this defendant, a member of such general public.

(g) That, independently of the question of the plaintiff's estoppel to deny the same, Rietzel is shown by the proofs to have been, in fact, the prior inventor over Harmatta.

(h) That Fred P. McBerty, of Warren, Ohio, invented and practiced the so-called method of the Harmatta patent in the year 1901, or nearly three years before the earliest date that can be set up for Harmatta.

(i) That the practical art of spot welding in this country was developed from knowledge derived from the said McBerty's work in 1901, first, by one Albertus C. Taylor, in 1904, at the works of the Winfield Electric Company, at Warren, Ohio, and secondly, by one William E. Smith, in 1905, at the Ohio works of the Carnegie Steel Company, at Youngstown, Ohio.

(j) That Sebastian Ziani de Ferranti, of London, England, was also the prior inventor over Harmatta, of the subject-matter of the Harmatta patent.

(k) That the disclosure of the Harmatta U. S. application, as originally filed, shows no disclosure of anything new, either by way of method or product, in the electric welding art, but that, aside from certain

immaterial details of apparatus not claimed to be embodied in and covered by the Harmatta patent, said Harmatta application discloses nothing that was not well known and that had not been previously disclosed and described in prior patents and publications in this and in foreign countries and particularly in the prior expired patents to Elihu Thomson once owned by plaintiff's predecessor.

(l) That the only kind of metal plates specifically suggested by Harmatta, either in his United States patent or in his foreign patents, as susceptible of being united by his process, i. e., plates of tinned sheet iron (fer-blanc) was the identical kind of plates described by Thomson in his earlier patents which plaintiff now claims do not embody Harmatta's conception.

(m) That the Harmatta U. S. application, as originally filed, discloses nothing distinguishing Harmatta's suggestions from the prior art—

- (1) As to the *kind* of metal plates to be united;
- (2) As to the *material* of which the *electrodes* employed to apply the pressure and current are constructed;
- (3) As to the size of the welds;
- (4) As to the amount of pressure required to be applied;
- (5) As to the amount of current to be applied;
- or
- (6) As to the time or duration of the application of pressure and current;

(n) That the defense of the Massachusetts suit against Barney & Berry, Inc., was inadequate and partial, and that the evidence regarding the conduct of that case leads to the suspicion, at least, that the

result reached was due to the suppression of defenses known by both sides to be available and to such collusion between the parties to the suit as to deprive the adjudication in that case of any weight or value whatsoever in the determination of the issues in the present suit; and

(o) That, finally, the whole course of conduct of the plaintiff and its predecessors, with respect to the subject of spot welding, has been so unjust and inequitable as to deprive the plaintiff of the right to any relief in a court of equity.

The trial Court saw and heard the fact witnesses who gave testimony in regard to the McBerty defense; saw the McBerty apparatus operated in his presence, and after most careful consideration of the whole case, filed an exhaustive opinion sustaining the majority of defendant's contentions, and ordered the bill dismissed. From the decree entered by the trial Court an appeal was prosecuted to the Circuit Court of Appeals for the Sixth Circuit and the latter Court affirmed the decision below, sustaining specifically the defense of lack of invention, without going into the other defenses of prior invention, prior public use, estoppel, etc., also sustained by the trial Court.

### **ELECTRIC WELDING**

The application of electricity as an aid in the welding together of parts or pieces of metal of various forms and shapes, adapted to various uses, has given rise to a terminology that is quite confusing to a layman and even to an expert.

In the testimony of witnesses given in this case, in

the prior patents relating to electric welding, and in the general literature of the art to which reference has been made, we constantly meet with such expressions as "arc welding," "resistance welding," "spot welding," "point welding," "projection welding," "electrode welding," "roller welding," etc. All these, however, refer to electric welding that may be classified as either, (1) Resistance Welding, or (2) Arc Welding.

In the standard publication of Hamilton & Oberg, entitled, "Electric Welding," these two classes are distinguished as follows (Rec., p. 191):

*"Different Systems of Electric Welding.*

The principle of electric welding is simple: the parts that are to be welded are heated to a welding temperature by means of an electric current. There are two ways in which the electric current can be utilized for heating to a welding temperature, and according to the methods used, two main processes or systems of electric welding may be distinguished—the electric resistance-welding process and the electric arc-welding process. In the former—the resistance-welding process—the parts to be welded are brought to a welding heat by the passage through them of an electric current of such voltage and amperage that the resistance to the flow of current is great enough to produce sufficient heat *at the points or surfaces to be welded*, so that, when the parts are brought together by a slight pressure, they will be joined by the fusing of the metal, that is, by welding.

In the latter system—the arc-welding method—an electric arc is drawn between the two electrodes or between the work and one electrode. This arc is brought into such a position relative to the work that the heat from the arc melts the metal to be welded, and enables the parts to be united.

There are various modifications of this latter process, but, in principle, the above description is correct."

This controversy has nothing to do with arc-welding, so we may dismiss from further consideration that sort of welding, simply calling attention to the Benardos & Olszewski U. S. patent No. 363,320 (Rec., p. 1030) as an exemplification of it.

**THE THOMSON PATENTS 347,140 (REC., p. 1021)  
AND 347,141 (REC., p. 1026) OF AUG. 10, 1886**

Prof. Elihu Thomson is justly entitled to the distinction of being known and regarded as the father of the art of electric resistance-welding.

On Aug. 10, 1886, he was granted two patents, viz., No. 347,140 and No. 347,141, the former claiming and covering the art or process, of resistance-welding, broadly, and the latter an apparatus for practicing that art.

Referring to the art patent, No. 347,140 (Rec., p. 1021), we find that therein Prof. Thomson, in his statement of invention said (p. 1, line 9, of the patent):

"My invention consists in a novel art or process of and apparatus for forming joints between metal wires, bars, and the like by the agency of an electric current. This art or process I term 'Electric Welding.' "

Again (p. 1, line 30 of the patent):

"Briefly, the new art, which I term 'Electric Welding' consists in bringing together with a certain pressure the *ends* of the wires, bars, etc., to be



jointed, and which pressure must be small, and can with my apparatus be regulated at will, and then constituting the abutted ends and a slight portion of the wire or bar on each side of such ends as the path for an electric current of great volume, but not necessarily of an electro motive force of more than a few volts (depending on the nature and size of the wire or bar). \* \* \*

“Either continuous, intermittent or alternating currents of electricity may be employed.”

In this art patent, Prof. Thomson illustrated the joining or welding together of various articles, that is to say in Figs. 1, 3 and 4, the *ends* of two round wires; in Fig. 10 the *ends* of two flat plates; in Fig. 11, the *end* of a round shaft to the *end* of a similar short shaft section connected to a flanged head; in Fig. 12, the *end* of a square shaft to the *end* of a smaller round shaft; in Fig. 13, the *ends* of a split ring; in Fig. 14 the *ends* of a split link; in Fig. 15, the *ends* of two light bars to the *end* of a thicker bar. The materials of the parts to be united, Prof. Thomson stated, might be “of copper and its alloys, iron, silver, gold, etc.” (p. 1, line 23), or “brass, iron, steel, or German silver” (p. 1, line 96).

The parts to be welded were described as being held by electrodes or clamps (K K') of good conducting material described in the companion apparatus-patent, 347,141 (Rec., p. 1026), as “of copper or other good conductor” (p. 1, line 76).

Some significance attaches to the fact that Prof. Thomson thus, in the early days, mentioned the practicability of electrically welding by his process sections of copper or of silver, as well as sections of iron, since it goes to show the thoroughness of his investigations and his full appreciation of the scope of his discovery at that time.

According to the tables issued by the Smithsonian Institute (Rec., p. 588), the resistivity of copper is 1.586, that of silver, 1.46, and that of iron, 8.85. Consequently, where Prof. Thomson used copper electrodes or clamps for the welding of *iron* pieces, his electrodes were of *lower* resistance than the work itself; where they were used for the welding of copper pieces they were of the *same* resistance as the work; and where they were used for the welding of silver pieces, they were of *greater* resistance than the work.

Throughout his art-patent, Prof. Thomson laid particular stress on the presence of pressure and fusing current *at the joint or point of contact between the articles being welded*, as constituting the gist and essence of his discovery. This is emphasized, for instance, in claim 1 of the patent:

"1. The herein-described art of effecting union between two pieces of metal, consisting in holding the same in contact *at the point of union* and simultaneously passing a current of electricity through the *joint* of a power to fuse and unite the pieces, as and for the purpose described."

The desirability of having clean the contacting surfaces to be united and of the wisdom of employing in some cases a flux to better the union, was also fully appreciated.

Thus, the patent states (p. 2, line 35):

"Of course, it is important that the wires shall be clean to insure contact, and though usually the joint is well formed without any flux, such as borax, there is no objection to its use in slight amount in certain cases. In such cases, after abutting the wires, a little moist powdered borax or other flux may be applied at J (the joint)."

(See Mr. Dyer's discussion of these patents, Rec., p. 548, *et seq*).

**THE THOMSON PATENT NO. 396,015 OF JAN. 8,  
1889 (REC., p. 1037).**

On Jan. 8, 1889, Prof. Thomson took another patent, No. 396,015, in which he disclosed an application of resistance-welding for uniting the proximate contacting plane surfaces of overlapped *flat plates*, in contradistinction to uniting the *end surfaces* of plates, bars or rods, as described specifically in his original art-patent, No. 347,140, just considered.

This application of resistance-welding by Prof. Thomson to the welding together of the *proximate contact surfaces of flat plates* was, it is true, incidental to the main purpose he had in mind when he devised the method and apparatus disclosed in this patent 396,015. Such main purpose was to fuse and upset, by the simultaneous application of pressure and an electric weld welding current, ordinary metal rivet blanks applied through openings in overlapped metal plates. Prof. Thomson proposed that, instead of pre-heating rivets in the usual manner, and passing them, while hot through the plates to be united, and then heading them up, he would heat the rivets *in situ* by means of the electric current and upset them by the pressure of the same electrodes that fed the current to them. But in developing this idea, it occurred to him, quite naturally, that not only could the current be utilized to soften and upset the rivets, but could also be utilized to weld the surface of the body of the rivets to the surface of the walls of the rivet holes in the plates; and it then, also quite naturally, further occurred to him that he could, by the use of a proper form of electrode, pass

the welding current *directly through the plates themselves* and weld the *proximate faces of such plates together*, so that he would have an exceedingly firm connection between the superposed or overlapped plates, consisting, first, of the upset rivets; secondly, of the weld between the rivets and the walls of the rivet holes, and, thirdly, of welds *directly formed between the plates themselves at points more or less remote from the rivets and rivet holes.*

The patent states (p. 1, line 17):

“In carrying out my invention I may swage or form both heads after the heating of the rivet-blank in position in the work, or may swage or form one head only, the rivet having been inserted with one head ready formed.

“The heating of the rivet when in position may be carried only to the point sufficient to permit it to be set by swaging or heading its ends, or the current may be allowed to pass for a longer period and until the central portion of the rivet, as well as the metal near thereto, is raised to a welding temperature, when the application of pressure expanding the rivet in its seat will weld the same to the metal surrounding it, and the application of pressure to the pieces to be riveted will weld them together around the rivet.

“*In some cases, I may cause the electric current to flow across from piece to piece of the parts to be riveted, as well as through the rivet itself.*”

Modified forms of apparatus by means of which the electrodes were caused to pass current through the plates themselves, to *thus cause welds to be formed between the proximate plane surfaces of the plates*, were shown in Figs. 9 and 10 of the drawings of the patent and were described in the specification of the patent

(p. 2, lines 50 to 87), and two illustrations of welds thus formed were portrayed in Figs. 6 and 7 of the patent drawings.

Mr. Dyer, defendant's expert, very lucidly analyzes this Thomson patent, No. 396,015 (Rec., pp. 548-551), and Prof. Thomson himself, when called as a witness for defendant, admitted, though reluctantly, that the patent disclosed the welding together of the plates themselves, face to face, in addition to the upsetting or welding in of the rivets passing through the plates, and that the patent claimed the method involving this. He was asked (Rec., p. 532):

"Q. 26. Is not the idea of welding the plates themselves together, also given expression in the sixth claim of this patent, which reads as follows:

'6. The herein described method of fastening two pieces of metal together, consisting in passing a heating electric current through a rivet or rivet blank passing through the pieces, *as well as through the pieces of metal themselves* in the neighborhood of the rivet, and applying pressure to set the rivet and weld the pieces together?'

"A. Undoubtedly that is one of the objects of the patent, as clearly shown in Figs. 6 and 7, not only to heat the rivets, but in some cases to allow the current to heat the plates so that they might be involved with the rivet in a weld."

This answer well illustrates how self-interest will induce a witness of even Prof. Thomson's caliber to equivocate and attempt to mislead. By his adroit reference to Figs. 6 and 7 Prof. Thomson sought to give the impression that claim 6 refers to the practice

represented by those figures, but when we come to look at the specification of the patent for a description of those figures we find that the plates of those figures are heated by conduction of heat from the current-heated rivets and not by the passage of the current directly through the plates themselves, as called for by the claim.

**THE THOMSON PATENT 444,928 OF JAN. 20, 1891  
(REC., p. 1047).**

Another application of electric resistance-welding is found disclosed in Prof. Thomson's patent No. 444,928, dated Jan. 20, 1891 (Rec., p. 1047).

There is no doubt about the purpose of the invention of this patent being to unite plane sheets of metal, face to face, by pressure and an electric welding current applied to the sheets to be united, the pressure being applied to the work through the electrodes that feed the current to the work, and *the welds being formed between the contacting faces of the work at the point of pressure, only.*

The patent states (p. 1, line 15):

“My present invention relates more particularly to the process, of joining or welding together strips, sheets, plates, or bars of metal where it is desirable to form a joint of considerable length, and is especially applicable to the welding of plates together at their edges, *instead of riveting*, to the welding of ribs or strips of metals to plates for the purposes of strengthening the same, to the formation of pipes by welding a longitudinal joint, to the welding of half-round or other shaped strips on one or both sides of a plate or strip of metal, and to other similar classes of work, as will be obvious.

"My present invention consists essentially, of forming an elongated joint by the electric welding process by feeding the work in the longitudinal direction of the joint through suitable pressure devices, the work being properly arranged so that the pressure devices will press the surfaces to be welded together, and simultaneously passing an electric current through the work at the point of pressure."

The specific means disclosed as suitable to be employed in the practice of the application of electric resistance-welding disclosed by this patent were two roller electrodes (Figs. 1 and 3) or two electrode segments (Fig. 2), of good conducting material, means for pressing the rollers or segments toward each other so as to clamp between them, face to face, the plates to be united, and means for supplying a suitable welding current to the electrode rollers or segments.

The patent states (p. 1 line 66):

"The frames F F' being of conducting material, may be connected with any suitable source of electric current of large volume through cables C, C, or by other means, so that an electric current may be caused to pass from one roll to the other, and *through any pieces of conducting material held between them in pressure contact.*"

After thus stating that the current may be passed through *any pieces of conducting material held between* the rolls, the specification goes on to describe the specific application of the process shown in Fig. 1, wherein two plates, *overlapped near their edges*, are portrayed as being operated upon by two electrode rollers R. R'.

The specification states (p. 1, line 84):

“The edges are slightly *overlapped*, as shown, and the plates, being in position between the rolls, may be squeezed together by means of the screw S, thus forming an electric contact between them. The electric current being now turned on as it passes from one roller to the other and across the *point of pressure* will heat the work to the welding temperature and soften the same slightly, after which the screw may be given a few more turns to effect a solid union.”

So far, the specification has certainly described a typical instance of the welding together, face to face, of two flat metal plates by means of two current-feeding roller-electrodes applied with pressure to the backs of the plates, the plates being first squeezed together by the rollers to make a good contact between them, then subjected to the action of the welding current at the “point of pressure” between the two plates, and, then, further squeezed “to effect a solid union” of the plates at that point.

Whether the contacting surfaces of the roller-electrodes are, initially, at the extreme end of the overlapped plates, or slightly distant, or greatly distant, therefrom, the specification does not state, but whether at one place or the other is wholly immaterial. Whenever the roller-electrodes press upon the interposed plates, and current passes, they produce, inevitably, a welding of the proximate contacting surfaces of the plates, at an isolated spot, and each time the rollers are opened, the work fed and the rollers closed again, another weld, at another spot, is produced.

After describing the production of the preliminary weld, the specification of the patent goes on to tell us how a continuous seam may be welded, as follows (p. 1, line 94):



"The work, *having been thus started*, may now be moved along through or between the rollers, so as to bring *successive parts of the joint* into position to be pressed and heated at the same time.\* By this operation the metal will become thoroughly united as it passes through and out between the rolls. It is obvious that the speed of the operation may be varied by varying the rate of heating and the rapidity at which the work may be fed through the rolls."

It is evident that Prof. Thomson thought he had made at least two advances in the art of resistance-welding by the disclosures of this patent, No. 444,928, namely, (1) broadly the union of two *overlapped plates* or pieces, *face to face*, at a spot, as distinguished from the union of two plates *end to end*, or abutted after the manner of his earlier patent No. 347,140, and (2) the union of two overlapped plates by a continuous seam.

The first, or broader invention, as expressed in the second claim of the patent, covers the making of the initial weld described by him preliminary to the production of a continuous seam, as follows:

"2. The herein-described improvement in forming electrically-welded joints, consisting in *lapping* the pieces to be welded upon one another, passing the lapped pieces through or between *suitable pressure devices forming the electrodes* of an electric heating circuit, and applying pressure to effect the weld."

This claim, it will be observed, is not limited to the use of roller electrodes, *any* "suitable pressure devices

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\*NOTE: Compare the statement in the original Harmatta specification respecting the action of his roller-electrode apparatus, i. e., "the pressure being exerted by roller-electrodes whereby *the advancing series of single points of the seam* to be welded is united to a whole with a minimum consumption of current" (Rec., p. 1358).

forming the electrodes of an electric heating circuit" being within its ambit; nor is it limited to the passing of the lapped pieces through the pressure devices, the insertion of such pieces *between* such pressure devices, in any way, being equally covered by it.

The narrower invention is covered by claims 1 and 3 of the patent, the former including the use of *any kind* of electrodes employed as "pressure devices," and the latter the use of *roller-electrodes* only.

Said claims read as follows:

"1. The herein-described method of forming an elongated joint by the electric welding process, consisting in feeding the work in the longitudinal direction of the joint through *suitable pressure devices*, while properly arranged so that the pressure devices will press the surfaces to be welded against one another, and simultaneously passing an electric current through the work at the point of pressure.

. . . . .

"3. The herein-described improvement in forming longitudinal seams or joints between strips or pieces of metal, consisting in feeding the strips or pieces through *suitable rolls*, while arranged in proper position to be pressed together by such rolls, and at the same time passing a heating electric current from one roll to another and through the surfaces to be welded, as and for the purpose described."

Before leaving this patent, we would again call attention to the fact that its disclosures afford other examples of a process of resistance-welding in which the electrodes, being of high conductivity, offer a relatively low resistance to the passage of the current as compared with the resistance offered to the passage of the

current by the plates themselves and by the joint between the contact surfaces of the plates, thereby resulting in the generation of the requisite degree of heat, *at such contact surfaces*, to raise the same to the proper welding temperature.

A more extended discussion of the disclosure of this patent will be found in the testimony of Mr. Dyer, defendant's expert (Rec., pp. 551, 575, 582, 586, 597).\*

**THE LEMP PATENT NO. 553,923 OF FEB. 4, 1896  
(REC., p. 1065).**

A hypercritical comment has been made by plaintiff's experts upon the disclosure of the Thomson patent No. 444,928, last above considered, to the effect that the contact face of the roller-electrodes illustrated in Fig. 1 of the drawing of that patent are shown as extending clear across the lapped portions of the metal plates being operated upon, thus necessitating the making of a line contact between the plates from edge to edge of such lapped portions.

This criticism is, of course, entirely without force, as it cannot possibly affect the essential nature of the process whether the plates are brought into line contact across the whole or a part only of the width of the overlapped parts; but, at all events, the criticism, if there were anything in it, is fully met by the disclosure of patent No. 553,923, granted Feb. 4, 1896, to Herman Lemp,—a collaborator of Prof. Thomson's,—wherein, in Fig. 2, is shown what purports to be an exemplification of the previous Thomson invention, in which the pair of roller-electrodes *do not*, in their posi-

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\*NOTE: In the Barney & Berry suit Judge Dodge held this Thomson patent No. 444,928 to be an anticipation of the Harmatta patent.

tion of operation upon overlapped or superposed plates, extend way across the overlapped or superposed parts, *but only part way across*.

(See Mr. Dyer's discussion of this patent, Rec., pp. 552, 587, 599.)

### THE THOMSON PATENT 496,019 OF APRIL 25, 1893 (REC., p. 1053).

In the early days of resistance-welding, Prof. Thomson was keenly alive to many and varied applications of it. In his lucubrations upon the subject he came to realize that he could unite by means of pressure and the electric current metal plates that were coated with a metal of lower fusibility than the plates themselves, as, for instance, plates of iron coated with tin. He evidently reasoned that if he could fuse or weld together the contact faces of thin iron plates themselves, as in his patent 444,928, he ought to be able to fuse or weld together the contact faces of such plates when surfaced with tin—a metal of higher resistivity though of lower fusibility than iron. See Table of Smithsonian Institution. (Rec., pp. 588, 589.)

He, accordingly, devised apparatus for carrying this idea into practice and disclosed the same in his patent No. 496,019, dated April 25, 1893.

In that patent he showed two ways of applying the resistance process in this new field, namely, one in which the tinned plates to be united were pressed together by electrodes of *iron or other metal* having a *lower resistance* than that of tin (the resistivity of iron being 8.85 and that of tin 13.0, Rec., p. 588), which would cause the fusing or welding temperature to be developed by the current, in greatest degree, in the tin coatings and at the joint between the inner con-

tacting surfaces of the coated plates; and the other, in which the tinned plates were pressed together by electrodes *faced with hard carbon*, which latter is a substance of *enormously greater resistance* than tin (the resistance of carbon being 720, while that of tin is as we have seen, but 13.0. Rec., p. 589), which would cause the heat developed at the joint to be supplemented by the heat developed by the resistance of the carbon faces of the pressure electrodes *at the backs of the plates*, such supplemental heat being transmitted, by conduction, through the plates to the inner faces or joint to be united.

In other words, Prof. Thomson found that in dealing with a metal of such high resistivity and low fusibility as tin he could, by the electric current, create heat sufficient to bring the tin to a fusing or welding temperature either (1) by using pressure electrodes of relatively *low* resistance (such as iron) and thereby develop the requisite temperatures *between the contact faces of the plates directly, at the joint*, or (2) by using pressure electrodes of relatively high resistance (such as carbon) to supplement the heat developed by the resistance of the joint by heat developed by the resistance electrodes at the backs of the plates, remote from the joint, and thus cause a proper fusion and union of the tinned faces of the parts at the joint.

In Figs. 4, 5 and 6 of the drawings of this Thomson patent, P, P' indicate the tin-coated parts to be united and C C' represent the pressure-electrodes of iron or other metal by which such parts are firmly pressed together and by which the fusing or welding current is fed to the work, developing, *directly at the joint*, the proper fusing or welding temperature.

Fig. 7 shows the modification in which the pressure

electrodes C. C' of iron or copper are faced with carbon, as at F F', so that there will be a large development of heat at the *backs* of the plates, due to the very high resistance of the carbon faces themselves and a transference of that heat *by the conduction of the parts P P'* to the inner tinned contact surfaces of the parts, at the joint.

While the patent does not show any specific means for holding the electrode blocks or pieces C C' illustrated in Fig. 6, the specification writer, Mr. H. C. Townsend, was careful to state (patent, p. 2, line 10) that:

“The clamping devices *and the means for regulating or controlling the current* may be such as are described in my prior patents Nos. 347,140, 347,141 and 347,142, or the clamping or pressure devices may be suitably modified, as to the shape of their clamping devices, when found desirable.”

Referring to the above-mentioned Thomson patent 347,141, for instance (Rec., p 1026), we find that the clamping devices there shown are lettered K K' (Figs. 1, 2, 3, 4) and are described as “made of copper or other good conductor” (p. 1, line 76); and that “suitable adjustments of current and elastic pressure are readily made *to suit the size of bars or wires and their conducting power*, so as to fuse or electrically weld them” (p. 2, line 10).

It should be carefully noted that the electrodes C C' of Fig. 6 of the Thomson patent No. 496,019, now under consideration, are cut away at their end faces like the electrodes shown in Fig. 3 of the Harmatta patent in suit, and, also, that *such end-faces cover less than the whole of the proximate surfaces of the parts P P' to*

*be united*, and, therefore, produce a weld that is entirely surrounded by an "area of unwelded union," such as is mentioned in the Harmatta patent (though not in the original Harmatta application).

In the modification of the electrode blocks shown in Fig. 7 of the Thomson patent, the blocks proper are said to be made of steel, or iron, or copper, faced with hard carbon (p. 2, lines 40 to 46); but, as carbon is fragile, the patentee says that he prefers not to use the carbon faces but to make notches or grooves in the faces of the metal blocks themselves so as to "leave only a series of points or ridges projecting" (p. 2, line 60), as shown in Figs. 8, 9 and 10; or, as an alternative construction, he provides the blocks with a series of projecting pins, as shown in Figs. 12 and 13.

Later, with reference to the forms of electrode pressure-blocks shown in Figs. 8 to 13, the patent goes on to state (p. 2, line 76):

"In all these cases the conduction of heat away from the *pieces* held between the blocks is greatly checked by the form given to the surfaces as described, *and the resistance to the passage of the current at the work is increased* which in itself results in further production of heat at the sheet metal pieces *where pressed up together* between the conducting blocks C. C'."

Now, the merest tyro in this art can see that if the faces of the electrode contacts are thus caused to present a series of separated points, the current will pass through those separated points only, will cause a fusion or welding of the faces of the sheets opposite those points, only, and will leave areas of unwelded union between the areas covered by the points.

In the modification illustrated in Fig. 19 of the patent, there is shown the employment of roller electrodes having serrated co-operating faces. The specification says (p. 2, line 111):

“The rollers exert pressure while the current heats the thin metal pieces *at successive points between the rollers.*”

This heating of the thin metal pieces, at successive points, means, of course, the production of a succession of separated independent welds or unions at those separated points, and it shows clearly that Prof. Thomson had not only, at that early day, worked out the problem of producing a continuous welded seam by the use of smooth roller electrodes as disclosed in his previous patent No. 444,928, but had also developed the idea of forming a discontinuous or interrupted seam wherein the successive welds were separated from each other, *so as to leave areas of no weld between them.*

Coming now, to the last modification illustrated in this patent under consideration, namely, that shown in Figs. 21 and 22, we find there a disclosure of *pin-electrodes* arranged to weld and unite superposed metal plates *at places or spots considerably less in area than the area of the overlapped parts.*

Two views are given of this modified form of apparatus, to-wit, a front elevation (Fig. 21) and a cross-sectional elevation (Fig. 22). The co-operating electrodes are arranged in sets, each set comprising an upper electrode C and a lower electrode C'. These sets of electrodes are arranged vertically in a frame in which they are supported and guided. There is applied to each upper electrode a spiral spring, the stress



of which tends to keep it elevated and there is applied to each lower electrode a similar spring which tends also to keep it elevated. Initially the proximate ends of each pair of electrodes are separated, as shown in the case of the pair at the left of Fig. 21, so that the overlapped plates or parts to be united (shown in the figure as two flat plates) may be inserted between them.

For a further description of this form of apparatus and its mode of operation, we give the patentee's own language, viz. (patent, p. 2, line 115):

"Fig. 1 shows how in one machine several sets of pressure pieces and current applying blocks may be successively operated, as where many pieces are to be operated upon in a given time. J to J' is a series of cams on a shaft driven by a pulley D, belted to power. The cams are set to act successively on the plungers C, so as to depress them successively against the action of the springs which raise them. Corresponding lower plungers C', insulated from the upper ones C, are arranged to be depressed in pinching or clamping the pieces between them. This is shown in Fig. 22, which is a view of one set only of the cams and plungers. I indicates insulation about plunger C'.

After pressure has been exerted to clamp the pieces the continued depression of the plungers by the cam S brings the lower end of C', at a, in contact with a current feeding plate below connected with a conductor K', from the current source, the other conductor K running to the upper plungers, as C.

The sequence of actions then is as follows:

Pieces are placed between the plungers, pressure is applied by cams S, current passes through the pieces, when the plungers are fully depressed, current is cut off as plungers begin to rise, and

finally the pieces are released as the cam completes its revolution.

These actions occur respectively at different times with the different sets of plungers."

Here, then, we have, in this patent No. 496,019, disclosed, as the invention of the great Elihu Thomson—the father of the art of electric welding—the welding together, by pressure and electric current, of plates of tinned iron (*fer blanc*)—the only metal specifically mentioned anywhere in the various disclosures of Har-matta's work as intended to be acted upon by his process as we shall presently see—in five different ways, namely:

(a) By the use of electrodes (iron or other metal) of *lower* resistivity than the plates, so as to cause the **maximum** resistance, and, consequently, the greatest heating effect, to be developed *in the plates themselves and at the joints between the plates*.\*

(b) By the use of electrodes (iron or steel or copper, faced with carbon) of *higher* resistivity than the plates, so as to cause a greater resistance, and, consequently, a greater heating effect, to be developed in the electrodes *at the backs of the plates* and the transference, by conduction, of such heat through the plates to the joint to be there added to the heat developed by the resistance of the plates themselves and by the resistance to the passage of the current from plate to plate at the joint.

(c) By the use of electrodes (iron or other metal) of *lower* resistivity than the plates, provided with small,

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\*Mr. Gravell, plaintiff's expert, admits that where tools or electrodes of relatively good conductivity are used the resistance to the passage of current from electrodes to plates is relatively small, while the resistance of the plates themselves and between the plates, at the joint, contributes most to the generation of the necessary welding heat (Rec., p. 79).

separated projections through which the welding current is applied, at separated localized spots, to produce isolated welds, with areas of no union between them.

(d) By the use of (iron) roller electrodes, of lower resistivity than the plates, such rollers, having peripheral serrations or teeth which conduct the current to the work at separate successive points and, by thus localizing the heat, producing isolated welds with areas of no weld between.

(e) By the use of opposed pin (iron or other metal) electrodes of lower resistivity than the plates, having contact areas less than the areas of the overlapped plates acted upon, so as to localize the current *at spots* and make welds that are isolated and surrounded by areas of no weld.

In all these applications, the electrodes first clamp the plates with pressure, then the current is turned on, and then turned off, after which the pressure is relieved, all as described in the Harmatta patent.

The Thomson patent states that (p. 2, line 10):

“The clamping devices and the means for regulating or controlling the current may be such as are described in my prior patents Nos. 347,140, 347,141 and 347,142.”

The amount of current and the duration of contact and pressure are thus entirely within the control of the operator.

In regard to the character of the plates intended to be operated upon, the Thomson patent says (p. 3, line 12):

“My present invention is especially applicable to use in uniting thin metals such as *tin plates*

without solder other than the tin on the surfaces, or with solder when found desirable.”\*

These and the other disclosures of the patent are discussed at length by Mr. Dyer, defendant's expert (Rec. pp. 553, *et seq.*, 575).

We would note, in passing, that while plaintiff's experts attempt to draw a distinction, in principle, between electric welding, electric brazing, and electric soldering, such distinction cannot be maintained, as shown by the following question and answer found in Mr. Dyer's deposition (Rec., p. 599) :

“X-Q. 148. Do you recognize a well defined difference in principle between electric welding by what is sometimes called the electric resistance process, wherein the pieces are brought to welding temperature by the development of internal heat in them and an electric soldering process such as is described in the Thomson patent No. 496,019?

A. No. I recognize no distinction in principle between the two, but regard the principle of one as precisely the same as the principle of the other, namely, the development of heat electrically in the neighborhood of the contiguous parts to be joined. I grouped the two processes in the same way that they are grouped by the Thomson Company, for instance, in the Lemp patent No.

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\*NOTE: It is interesting to note that while Harmatta in his original U. S. application, in his U. S. patent, in his Canadian application, and in his British patent, makes no mention at all of the kind of metal he proposes to weld; he does in his French patent, based upon the same identical apparatus, explicitly designate tinned iron (*fer-blanc*), three times—twice in the specification and once in the claims—as the metal to which his welding scheme is specifically adapted (Rec. pp. 1141, 1142, 1145, 1146, 1147).

It, therefore, does not lie in plaintiff's mouth to urge that the welding of tinned iron plates is not, exactly, the Harmatta invention!

553,923, which states that the invention relates to 'welding, soldering, cementing or similar operation.' The only difference is the necessary adjustment of current and time to secure the desired heating principle."

Mr. Dyer might have added that Prof. Thomson, in his so-called "Electric Soldering" patent, No. 496,019, groups electric soldering, brazing and welding together as belonging to the same class, thus (Rec., p. 1055):

"My present invention, like my prior inventions in electric soldering, brazing and welding, involves the use of electric currents of low potential but large volume derived from any suitable source, together with suitable devices whereby the current may be cut off or regulated."

It has sometimes occurred to the writer of this brief that the title given the Thomson patent No. 496,019, *i. e.*, "Electric Soldering," represented an effort on the part of the specification writer (Mr. Townsend) to divert the mind of the Patent Office Examiner from the subject of electric welding to the subject of electric soldering with a view to giving the impression that Prof. Thomson's previous work in electric welding was quite different from his soldering scheme. The fact is, there is no true soldering described, with even fair particularity, anywhere in the patent, while the manipulation and electrical welding of tinned iron plates is specifically referred to throughout. If the writer of the Thomson specification had frankly described the invention as a process of electrical welding plates of tinned iron, as did Mr. Harmatta in his French patent No. 336,187, at a later date, when speak-

ing of the union of tinned iron (*fer blanc*) plates, he would have stated the truth and the Thomson patent would not have been open to this criticism.

**THE ROBINSON PATENT 574,942 OF JAN. 12, 1897  
(REC., p. 1070).**

Other applications of electric resistance welding are disclosed in the Robinson patent No. 574,942, dated Jan. 12, 1897.

Robinson's purpose was to utilize the electric resistance-welding process in the production of railway joints.

One of the applications of this process shown by him was the welding of a fish plate or splice bar to the web of a railroad rail. In this embodiment of the process the fish plate or splice bar (C, Fig. 11) has formed upon its inner face at its upper and lower edges a series of isolated projections (*i, i*) which are adapted to bear against the plane vertical face of the web of the rail when the parts are pressed together by the electrodes that also supply the welding current.

The patent says (p. 2, line 92) :

“When the plate C is placed in the groove of the rail in position to be welded, these projections *i* find a bearing against the rail adjacent to the upper and lower corners of the groove of the same. The projections *i* are normally long enough to keep the main body of the plate C a short distance away from the rail. As soon, however, as the welding-current is turned on it quickly brings the projections *i* and the parts of the rail touched by them to a welding heat. The clamp is now applied to press the plate C and rail together to complete the weld as shown in Figs. 13 and 14.”

The patentee points out that instead of employing the small projections on his fish plate or splice bar, he may use a series of ribs, as shown in the dotted lines, Fig. 16, but says (p. 3, line 20):

“I prefer the arrangement of small independent projections to facilitate rapidity of welding, economy of current, and in order to have several small *welding spots* distributed over the rail rather than to have any single larger surface of the rail brought to a welding heat since the latter would be liable to deteriorate the rail.”

The several other disclosures of this Robinson patent are discussed at length by Mr. Dyer (Rec., pp. 558-559), and the conclusion that he reaches is as follows (Rec., p. 559):

“While, therefore, Robinson still makes use of the well known principles of resistance welding, he suggests the special refinement of welding the two pieces together in isolated spots (he calls them ‘welding spots’) which will be surrounded by very much larger areas of non-welding, and he localizes the welding current in these spots by providing projections or points which are traversed by the heating current and brought to the welding temperature, likewise heating the plates with which they contact to the welding temperature, so that when pressure is applied each projection so heated will constitute or form a single spot weld.”

It is not amiss to add that not only did Robinson describe this application of the resistance welding to overlapped or superposed plates, but he made it the subject of several claims, a typical one of which is the following:

"8. In a rail joint a splice bar constructed for welded attachment to one only of the abutting rails, said bar being provided with a plurality of welding projections grouped nearer to one end of said bar than the other, said projections forming a plurality of welding connections with the same rail, the portion of said splice bar between said projections, and not raised to a welding heat, limiting the compression and regulating the predetermined relative position of said splice bar and rail when welded together, substantially as described."

**THE KLEINSCHMIDT PATENT NO. 616,436 OF  
DEC. 20, 1898 (REC., p. 1076).**

An application of resistance-welding very much like that of the patentee Robinson is found in the Kleinschmidt patent, No. 616,436 of Dec. 20, 1898.

Kleinschmidt, like Robinson, had in view the welding of splice bars to the webs of railroad rails. His patent shows in Fig. 2 a representation of his splice bar before welding. It is a bar that is generally plane-faced, but has a relatively low projection *b* near each end and a third low projection near the middle extending vertically across the face of the bar.

To secure the splice bars to the webs of the rails the bars were first clamped to the webs with their projections against the latter, by means of the circuit terminals or electrodes *C*, the welding current was then turned on and maintained until the parts were raised to the welding temperature, after which the current was turned off and the pressure retained until the parts cooled. As Kleinschmidt was dealing with parts of considerable mass, he laid much stress on the retention of the pressure on the parts after the cutting off of the current in order to make a more perfect union.



THE BURTON PATENT NO. 647,694 OF APR. 17,  
1900 (REC., p. 1079).

Resistance-welding applied in many ways is disclosed by the Burton patent, No. 647,694 of April 17, 1900.

The patentee says (p. 1, line 9):

"This invention relates to electric metal working apparatus for forging, welding and brazing of metals and for heating metal articles, such as wheel tires, for the purpose of setting them.

"The invention is especially adapted for lap welding by the use of a primary transverse current. The lap weld is superior to the butt weld. *No end pressure* is required, and consequently, there is *no upsetting of the metal and no formation of a bulge or projection at the joint*, which is afterward required to be filed or hammered down."

The patent shows a rotary electrode head carrying on its various arms a variety of electrode tools adapted to co-operate with an electrode bed 100.

The mode of operation, where lap-welding is to be done, is described in the patent, as follows (p. 2, line 67):

"In the use of this apparatus the pieces to be lap-welded are adjusted or placed with their ends overlapping on the bed electrode 100. Then the foot lever is depressed and one of the electrodes of the electrode head is brought into contact with the work, whereby the circuit is closed and the current passes through the work in transverse direction across the overlapping ends of the parts to be heated. The current may pass in either direction from the generator and effect the result

equally well. As soon as the piece is heated to the proper temperature, which may be ascertained by inspection thereof, the operator releases the foot lever and the spring 170 lifts the hinged lever 150 and takes the upper electrode out of contact with the work, whereby the circuit is broken. Then the operator *may* shove the work forward on the anvil and hammer the joint or otherwise finish it, as desired."

Of course, if the parts worked are heavy, the joint may be improved by hammering on the anvil, but if they are relatively light this will not be required, nor done. The hammering step is plainly optional. It may or may not be resorted to.

Now, considering so much only of the prior art of electric resistance-welding as has been, so far, developed herein, it would seem perfectly obvious, even to a layman, that if the spherically ended electrode 240 of the electrode head of Burton should be brought around into operative relation with the flat copper bed electrode 100, and if the two pieces of metal to be lap-welded should be superposed or overlapped and placed between those electrodes and pressure and current applied and released, in accordance with the teachings of the patent and of the art, generally, the result would, inevitably, be a welding together of the two overlapped pieces, face to face, at a single isolated spot, and the weld so made would be surrounded by unwelded portions of the metal, in other words, a so-called, spot weld.

This is the view of defendant's expert, Mr. Dyer (Rec., pp. 560, 561, 577-579, 581, 587, 588, 605, 606, 607).

THE PERRY PATENT NO. 670,808 OF MAR. 26,  
1901 (REC., p. 1083).

Another interesting example of resistance-welding is disclosed by the patent to Perry, No. 670,808, dated Mar. 26, 1901.

The welding together of crossed wires or of spherical bodies is described in this patent, whether these bodies be plain and uncoated, or coated with another metal.

When uncoated crossed wires are to be united they are crossed and pressed together in intimate contact by means of low resistance electrodes and the welding current is passed through until the contact surfaces of the wires are brought to the fusing or welding point, when the current is automatically cut off. The surfaces to be welded are, initially, but mere points of contact such as exist at the place where two crossed cylindrical bodies meet and touch each other, but the moment that pressure and current are applied, these points of contact, of course, flatten somewhat and the welded union really takes place between *small flattened surfaces* surrounded entirely by unwelded portions of the metal.

All the essentials of resistance-welding or, so-called, spot welding, with low resistance electrodes are, therefore, present. The bodies to be united are brought together face to face, instead of end to end; the low resistance electrodes are shaped to concentrate the current; the current is a welding current of high amperage and low voltage; pressure and current are simultaneously applied; and the current is automatically cut off.

The patentee says (p. 1, line 34):

“By my invention the welds are made instantaneously without any appreciable heating of the material adjacent to the point of the weld, and my improved method consists in the simultaneous application to the parts to be joined or welded of a mechanical pressure nearly equal to the crushing strength of the material and a current of electricity of relatively enormous volume. By using a mechanical pressure nearly equal to the crushing strength of the material, I insure the parts being forced together the instant they soften, and by the employment of a current of electricity of relatively enormous volume compared with the area of contact of the parts to be welded, I am enabled to produce an instantaneous heating or softening of the metal. The welding current is much stronger than has heretofore been considered suitable, being from one to two hundred thousand amperes to a square inch, while the mechanical pressure of the electrodes for forcing the heated parts together, is nearly equal to the crushing strength of the material being welded when cool. As a result of this the parts to be welded are first brought into intimate contact and immediately thereafter the circuit is closed between the electrodes. The current is of such strength that the contacting parts of the said members become heated to a fusing point immediately and as soon as the metal sufficiently softens, so that its resistance is less than the force of the compression spring or weight, such spring or weight forces the movable electrode farther toward the stationary electrode to weld the parts together. Immediately after this compression the circuit is broken and before the heat is spread away from the contacting surfaces. Consequently, the metal cannot be overheated or blown out. As the electrodes are relatively of large volume or area compared to the contacting metal to be welded, there is no necessity for artificial cooling.”

THE PARKINSON BRITISH PATENT NO. 14,536  
OF 1894 (REC., p. 1112).

Among the various industrial applications of resistance-welding disclosed in the prior art patents is the securing in place of the "glut pieces," so-called, to the arms or spokes of a metallic wheel. Each glut piece is a triangularly-shaped piece of metal whose inclined sides are adapted to fit between and against the correspondingly-shaped surfaces of two adjoining metallic segments or spoke-portions of the wheel.

The parts are clamped together by low resistance electrodes consisting, on the one hand, of a single electrode bearing against the base of the glut piece and, on the other hand, of two separate electrodes, one of which bears against the one segment-arm and the other against the adjoining segment-arm.

On pressure being applied and a proper welding current turned on, the resistance of the glut pieces (which is lower than that of the electrode) and the resistance offered to the passage of the current at the joint between the glut piece and the segment-arms, causes the proximate faces of the parts at the joint to be raised to a fusing or welding temperature. Continued pressure firmly unites or welds the parts together.

In the discussion of this Parkinson patent by Mr. Dyer, defendant's expert (Rec. pp. 565, 566, he says (p. 566):

"In operation, when the contact piece M is forced by hydraulic pressure against the glut piece, the two contact arms or electrodes L will be pressed on the inside of the wheel opposite the glut piece, so that when heating current is applied it will flow from each electrode L through

the metal of the wheel, past the joint between the same and the glut piece and through the glut piece to the contact piece M. Each electrode L, therefore, feeds the current into the work in a limited area, and the current is, therefore, concentrated or localized by the electrode, so as to heat the metal at the joints and within a localized area to the welding temperature, whereby, under the hydraulic pressure, a limited isolated weld will be formed between each wheel segment and one of the glut pieces, which welds will be surrounded by extended areas of non-welding. This patent, therefore, discloses a further field of usefulness to which resistance-welding may be applied, namely, for the manufacture of railway or other wheels, it utilizes the same resistance principle originally disclosed by Prof. Thomson, in which the resistance of the work is depended upon to secure the heating effect, the current is localized and pressure is localized by means of an electrode of limited area, whereby the heating current is confined to a restricted path which cuts the joint and in this way the heating effect is localized or restricted, whereby the metal at the joint within a limited area will be brought to the welding temperature so that when pressure is applied between the parts an isolated weld will be secured, surrounded by areas of non-welding."

**THE DE FERRANTI BRITISH PATENT NO.  
11,921 OF 1903, FILED MAY 25, 1903 (REC.,  
p. 1119).**

A short description of the disclosure of this patent given by Mr. Dyer, defendant's expert (Rec. p. 567) will suffice, for present purposes (p. 567):

"I next refer to British patent to de Ferranti No. 11,921 of 1903, application for which was filed May 25, 1903, describing still another field of usefulness to which resistance-welding may be ap-

plied, namely the welding of turbine blades to the disks, drums or the like which carry them. Referring to Fig. 2, for instance, the disk or drum is shown as being provided with two sets of intersecting grooves *c* which result in the formation of a series of points or projections rectangular in cross section. The turbine blades *d* are now placed in position radially, and when heating current is passed through the blades the current will be concentrated by so much and so many of the projections as may make contact with the engaging surface of the blade, and by means of these projections the current will be concentrated so that the projections themselves, as well as those parts of the blade surface as may contact with the projections will be brought to the welding temperature, whereby, when pressure is applied a series of separate isolated welds will be formed surrounded by areas of non-welding. In Figs. 3 and 3a the same general principle is applied, except that the current is concentrated at the weld by forming the disk with two circumferential and parallel ribs, whereby two isolated welds will be formed to hold each blade in place. In Fig. 9a three of such ribs are shown, resulting in the formation of three isolated welds, and in Fig. 6 the face of the disk is bored with closely arranged holes *h* whereby the current will be localized by the metal between the holes and the resulting welds will be surrounded by areas of non-welding.”\*

**THE GERMAN PATENT OF BENARDOS NO.  
50,909 OF MAY 8, 1889, ISSUED FEB. 19, 1890  
(REC., p. 1148).**

The process of electric resistance-welding is also shown applied, in various ways, in the German patent of Benardos, No. 50,909 of May 8, 1889.

\*NOTE: The claims of de Ferranti as a prior inventor over Har-matta, under Sec. 4887 R. S. U. S., and the International Convention, are discussed in the brief (p. 152).

Defendant has introduced a translation of this patent (Rec. p. 1152), made by Mr. Howard A. Coombs, of Washington, D. C. (Rec., p. 702), and plaintiff has offered another translation made by Mr. Walter Brant, of West Roxbury, Mass. They do not differ in any material respect.

Beyond any question, Benardos contemplated the welding of relatively thin plates of metal by the aid of electrodes which applied pressure and fed the welding current to the work at the point where the weld was to be formed. His dominant thought undoubtedly was to use electrodes of relatively poor conductivity and high resistance so as to develop heat in the electrodes themselves at the backs of the plates as in Thomson patent No. 496,019 hereinbefore considered. He contemplated both electric soldering and electric welding, for his patent states (Rec., p. 1152):

“This process may serve to directly *weld* together relatively thin metal sheets and rods, of one and the same or of different metals; to the joining of metals with the use of a solder; to heating metal objects or parts to a definite temperature for the purpose of hardening them, and to annealing hardened objects by heating them to a certain temperature.”

In the form of apparatus shown in Fig. 1 of his patent the current employed passes through his pressure electrode and thence through one only of his overlapped plates, the heat generated in the electrode itself being relied upon to raise the overlapped parts to the proper welding temperature.

In the form of apparatus shown in Fig. 6, the current does not pass directly through the work at all,



but merely through electrodes, each of which forms part of a separate circuit. The patent says (Rec., p. 1154):

“Fig. 6 illustrates an apparatus which is distinguished from those hereinbefore described in that the current does not pass through the work itself.”

The form of apparatus which is, however, of particular interest in this case is that shown in Fig. 2, which is described as follows (Rec., p. 1153):

“Fig. 2 shows, in plan, elevation and end view, an apparatus designed to carry out the process in the manner just described. Two welding tools K' K'', are united in the manner of a pair of shears or tongs, both being oscillatably mounted on the pivot C. The current is prevented from passing from one tool to the other through the said pivot by the interruption of insulating material. Binding screws D' D'', receive the ends of the flexible cables connected to the poles of the source of electricity. The current thus flows from D' through K' to w', from this block of refractory and poorly conducting material through the metal of the work to block w'', and returns through K'' and D'' and through a rheostat to the source of electricity. H' and H'' are the wooden handles, and E is a spring by which the two blocks w' and w'' are pressed together (apart).”

The patent mentions as examples of relatively bad conducting materials that may be employed as electrodes, graphite, prepared carbon, mixture of clay with carbon, magnesium, iridium, carbon with thin metal coatings (Rec., p. 1152).

Taking copper as a standard, all these enumerated materials are undoubtedly relatively poor conductors, yet some of them are better conductors than iron, of which the plates to be united are supposed to be composed, as the following table shows (Rec., p. 589):

Conductivity of	Copper.....	100.
"	Magnesium ...	36.2
"	Iridium .....	26.
"	Tungsten .....	28.8
"	Iron .....	17.9
"	Graphite .....	.195
"	Carbon .....	.22

The merest tyro in this electric resistance-welding art must appreciate that when electrodes made of any of the materials mentioned by Benardos as suitable, are employed to clamp the superposed metal plates and to feed the current through the work from one electrode to the other, as contemplated in the use of the apparatus of Fig. 2 of the patent, the current *must*, if it passes at all, encounter the resistance of the electrodes, the resistance of the joints between the electrodes and the backs of the plates, the resistance of the plates themselves, and the resistance of the joint between the inner contacting faces of the plates, and that wherever this resistance is encountered heat will be developed.

If carbon or graphite electrodes, or any other electrodes of low conductivity and high resistivity are used, to weld plates of higher conductivity and lower resistivity more heat may be developed in them than in the plates themselves, or at the contact surfaces between the plates, and a portion of the heat utilized at the place where welding actually occurs, namely, at the point of surface contact between the plates, may

be conveyed there by *conduction*; or, at least the heat generated at such point of surface contact between the plates will not be conducted away by such electrodes\* whereas, if the electrodes used are made of magnesium or of iridium, or of carbon coated with metal, or of any other materials, whose resistivity is lower than that of the plates, the greatest resistivity and the consequent greatest heat development will take place in the plates and at the contact surfaces between the plates.

In any case, the contact of the electrodes with the plates will be restricted to a spot, the heating electric current will be passed from one electrode to the co-operating electrode through that spot to heat the work to the welding temperature and the pressure will be applied to the work in line with said spot to effect a

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\*NOTE: There will be found in the record (Rec., p. 2094) a copy of patent No. 1,176,614, granted March 21, 1916, to A. M. Stanley, assignor to the General Electric Company (by which Professor Thomson is now employed as consulting engineer) which describes the use of tungsten, molybdenum, or other metals of low conductivity and high resistance as especially adapted to the spot welding of metal plates and particularly of plates of copper. The patent states (p. 1, line 85):

"I have found that in order to successfully weld sheet copper (which may here serve as the representative of low resistance and good heat conducting metals) it is necessary that the pressure contacts be of a material that has a considerably higher specific resistance than copper and that its ohmic resistance be sufficiently high that it may be heated by the current as much or more than the copper and then act as a barrier to heat conduction from the work; that it be a comparatively low conductor of heat for the same purpose; that it be *more refractory* than copper, so that it will not soften and become welded to the copper; and that it have considerable mechanical strength and not be noticeably deteriorated by exposure to air at the temperatures to which it is subjected. I have found all these characteristics combined in the metals tungsten and molybdenum, and by the use of either of them as pressure contacts, I have been able to weld together sheets of copper and other metals of like properties safely and expeditiously, and without deterioration of the contacts after long continued use."

welding of one plate to another, and the Harmatta process of so-called spot welding will be practiced.

Moreover, the work so produced will be metal work comprising a metal plate fastened on its surface to the opposed surface of another piece of metal by a weld at a spot only in the material of the opposed surfaces, said spot being surrounded by a distinct area of unwelded union, and will be the product of the Harmatta patent.

A detailed explanation of this Benardos German patent will be found in Mr. Dyer's deposition (Rec., pp. 563, 589, 608 *et seq.*, p. 611, *et seq.*).

Mr. Dyer testified to having made many tests demonstrating the practicability of producing, so-called spot-welds by means of carbon electrodes, graphite electrodes, electro-plated carbon electrodes (pp. 601, 612), iridium electrodes (pp. 601, 613) and offered in evidence photographs showing many of the forms of electrodes used by him (p. 612). (See photograph opposite, and explanation of same, Rec., p. 612.)

He also offered to repeat his tests for the benefit of plaintiff's counsel (p. 613).

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This patent constitutes the finest kind of corroboration of the testimony of defendant's expert, Mr. Dyer, to the effect that electrodes composed of refractory material of low conductivity and of relatively high resistance, like some of those proposed by the Benardos German patent, are entirely available for the practice of spot welding. According to the official tables quoted by Mr. Dyer, the resistance of iridium mentioned by Bernados as available is 6.1 and its conductivity is 26, while the resistance of tungsten, the metal recommended by the Stanley patent, as highly available, is 5.57, and its conductivity is 28.8.

It is interesting to note that the Stanley patent discloses the use of tungsten for spot welding, both in the form of roller electrodes and in the form of pin electrodes, indicating that both forms are regarded as equivalents, by Stanley, just as they were apparently regarded as equivalents by Harmatta, in his original U. S. application.

As in view of the disclosure of the Stanley patent the Benardos apparatus would plainly spot-weld copper sheets, it is clear that Benardos is a clean-cut anticipation of Harmatta, who undertakes, in his U. S. patent, to cover the spot welding of *all* metals by any *sort* of electrodes, whether of high or of low resistance.





Mr. Gravell, plaintiff's expert, admits that carbon electrodes, coated with metal, will produce spot welds (Rec., p. 84).

**The Application of Electric Resistance-Welding Here in Controversy Was Never Patentable to Harmatta.**

The alleged process or improvement in the art that is here being exploited as the invention of Johann Harmatta never was an invention patentable to him, but is a mere obvious application of the principles of electric resistance-welding well known before his time.

Let it be distinctly understood that there is no patent for a machine or apparatus before the Court. The patent is, first, for a process, and, secondly, for an article made by that process.

The essential steps of the process are (1) overlapping or superposing two metal parts, face to face, (2) applying pressure and current to a portion only of such overlapping parts, (3) maintaining such pressure and current till the contact surfaces of the portions of the parts to which such pressure and current are applied are welded together at such contact surfaces only.

As a process, it differs from the process of the original Thomson art patent of 1886 only in the fact that the welding is localized in a relatively small contact spot instead of extending over the entire proximate surfaces of the parts to be united.

It is exemplified in the Thomson, so-called, riveting patent No. 396,015, wherein the plates are welded together in spots remote from the rivet; in the Thomson, so-called, roller-electrode patent No. 444,928, in

the Lemp patent, No. 553,928, and in Figs. 2 and 3 of the original Harmatta application wherein the overlapped sheets of metal are united, first, at a spot or part only and then at a succession of spots or parts; in the Thomson, so-called, soldering patent, No. 496,019, in which tin-coated iron plates are united in spots of limited area either by the localization of current between the plates or at the backs of the plates or at both places; in the Robinson, so-called, rail-joint patent, No. 574,942, wherein a plate formed with small isolated projections is welded to an opposing flat plate; in the Kleinschmidt, so-called, rail-joint patent, No. 616,436, wherein, also, a plate with isolated projections is welded to an opposing flat plate; in the Burton patent, No. 647,694, wherein overlapped plates are welded together in spots only by means of a spherically-shaped electrode, on the one side, and a flat co-operating electrode, on the other; in the Perry patent, No. 670,808, wherein crossed wires are welded together in isolated spots by the operation of opposed electrodes; in the de Ferranti British patent, No. 11,921, of 1903, wherein a turbine blade is welded in spots only to the blade carrier; in the Parkinson British patent, No. 14,536, of 1894, wherein the glut pieces are welded in spots to wheel segments by the application of opposed electrodes which apply the suitable pressure and current; in the Benardos German patent, No. 50,909, of 1889, and in the Harmatta patent in suit wherein overlapped sheets of thin metal having uninterrupted plane surfaces are welded in isolated spots by means of opposed pointed electrodes which apply the requisite pressure and current at the spots only; and in the Rietzel patent, No. 928,701, of 1909, wherein one or both of the sheets is or are pro-







vided with separate welding projections through which the pressure and current are applied.

Once we rid ourselves of the notion that this process or method is confined to the use of any specific form of apparatus or instrumentality, we will have no difficulty in apprehending just what the process in essence is.

On the folder opposite we have illustrated the various applications of resistance welding shown in the patents above referred to, whereby welding in isolated spots is accomplished.

### Process Distinguished From Apparatus

This Court has always distinguished a process from the mere function of a machine or apparatus.

In the recent case of *Expanded Metal Company vs. Bradford*, 214 U. S., 366, the Court in reply to the contention that a process, to be patentable, must be the result of chemical or other similar elemental action, reviewed its former decisions and held that a process or method involving mechanical operations might be patentable, independently of the particular mechanisms for performing it.

Mr. Justice Day in delivering the opinion of the Court, said (p. 382):

“An examination of the extent of the right to process patents requires consideration of the object and purpose of the Congress in exercising the constitutional power to protect for a limited period meritorious inventions or discoveries. Section 4886 of the Revised Statutes provides:

“Any person who has invented or discovered any new and useful art, machine, manufacture or composition of matter, or any new and useful improvement thereof \* \* \* may obtain a patent therefor.”

This is the statute which secures to inventors the right of protection, and it is not the province of the courts to so limit the statute as to deprive meritorious inventors of its benefits. The word 'process' is not used in the statutes. The inventor of a new and useful art is distinctly entitled to the benefit of the statute as well as he who invents a machine, manufacture, or composition of matter. The word 'process' has been brought into the decisions because it is supposedly an equivalent form of expression or included in the statutory designation of a new and useful art.

"What then is the statutory right to a patent for a 'process' when the term is properly considered? Curtis, in his work on the Law of Patents, says:

" 'A process may be altogether new, whether the machinery by which it is carried on be new or old. A new process may be invented or discovered, which may require the use of a newly invented machine. In such case, if both the process and the machine were invented by the same person, he could take separate patents for them. A new process may be carried on by the use of an old machine in a mode in which it was never used before \* \* \*. In such a case, the patentability of the process in no degree depends upon the characteristic principle of the machine, although machinery is essential to the process, and although a particular machine may be required.' Curtis, 4th Ed., Sec. 14.

"In Robinson on Patents, Vol. 1, Sec. 167, it is said:

" 'While an art cannot be practiced except by means of physical agents, through which the force is brought in contact with or directed towards its object, the existence of the art is not dependent on any of the special means employed. It is a legal, practical invention in itself. Its essence remains unchanged, whatever variation takes place

in its instruments as long as the acts of which it is composed are properly performed.'

"And Walker on Patents, 4th Ed., Sec. 3, states that valid process patents may be granted for 'operations which consist entirely of mechanical transactions, but which may be performed by hand or by any of several different mechanisms or machines.'

"It is undoubtedly true, and all the cases agree, that the mere function or effect of the operation of a machine cannot be the subject-matter of a lawful patent, but it does not follow that a method of doing a thing so clearly indicated that those skilled in the art can avail themselves of mechanism to carry it into operation, is not the subject-matter of a valid patent. The contrary has been declared in decisions of this Court. A leading case is *Cochrane vs. Deener*, 94 U. S., 780, in which this Court sustained a process patent involving mechanical operations, and in which the subject was discussed by Mr. Justice Bradley, speaking for the Court. On page 787, that learned justice said:

" 'That a process may be patentable, irrespective of the particular form of the instrumentalities used, cannot be disputed \* \* \*. Either may be pointed out; but if the patent is not confined to that particular tool or machine, the use of the others would be an infringement, the general process being the same. A process is a mode of treatment of certain materials to produce a given result. It is an act, or a series of acts, performed upon the subject-matter to be transformed and reduced to a different state or thing. If new and useful, it is just as patentable as is a piece of machinery. In the language of the patent law it is an art. The machinery pointed out as suitable to perform the process may or may not be new or patentable, whilst the process itself may be altogether new and produce an entirely new result. The process requires that certain things

should be done with certain substances, and in a certain order, but the tools to be used in doing this may be of secondary consequence.'

"This clear and succinct statement of the rule was recognized and applied (Mr. Justice Bradley again speaking for the Court) in the case of *Tilghman vs. Proctor*, 102 U. S. 707. In the course of the opinion the learned justice tersely says:

" 'A machine is a thing. A process is an act or a mode of acting. The one is visible to the eye—an object of perpetual observation. The other is a conception of the mind, seen only by its effects when being executed or performed. Either may be the means of producing a useful result.'

"That this court did not intend to limit process patents to those showing chemical action or similar elemental changes is shown by subsequent cases in this court.

"In *Westinghouse vs. Boyden Company*, 170 U. S. 537, the opinion was written by the same eminent justice who wrote the opinion in *Risdon Locomotive Works vs. Medart*, 158 U. S., *supra*, and delivering the opinion of the Court, he said (p. 557):

" 'These cases (158 U. S. 68, and 103 U. S. 461) assume although they do not expressly decide, that a process to be patentable must involve a chemical or other similar elemental action, and it may be still regarded as an open question whether the patentability of processes extends beyond this class of inventions.' And added these significant words:

" 'Where the process is simply the function or operative effect of a machine, the above cases are conclusive against its patentability; but where it is one which, though ordinarily and most successfully performed by machinery, may also be performed by simple manipulation, such, for instance, as the folding of paper in a peculiar way for the manufacture of paper bags, or a new method of weaving a hammock, there are cases

to the effect that such a process is patentable, though none of the powers of nature be invoked to aid in producing the result. *Eastern Paper Bag Co. vs. Standard Paper Bag Co.*, 30 Fed. Rep. 63; *Union Paper Bag Machine Co. vs. Waterbury*, 39 Fed. Rep. 389; *Travers vs. Am. Cordage Co.*, 64 Fed. Rep. 771. This case, however, does not call for an expression of our opinion upon this point, nor even upon the question whether the function of admitting air directly from the train pipe to the brake cylinder be patentable or not, since there is no claim made for an independent process in this patent, and the whole theory of the specification and claims is based upon the novelty of the mechanism.'

"And the same learned justice wrote the opinion of the court in *Carnegie Steel Co. vs. Cambria Iron Co.*, 185 U. S. 403, and sustained a process patent. If by any construction that process could be said to involve a 'chemical or other similar elemental action,' no stress was laid upon that fact. This court, speaking through Mr. Chief Justice Waite, sustained a patent in the *Bell Telephone Cases*, 126 U. S. 1, for a method of transmitting electrical undulations similar in form to the vibrations of the air accompanying vocal sounds, and at the same time the patent for the apparatus by which the method was operated was sustained.

In *Leeds & Catlin vs. Victor Talking Machine Company*, decided at this term, 213 U. S., 301, 318, this court said: 'A process and an apparatus by which it is performed are distinct things. They may be found in one patent; they may be made the subject of different patents.'

"We therefore reach the conclusion that an invention or discovery of a process or method involving mechanical operations, and producing a new and useful result, may be within the protection of the Federal statute, and entitle the inventor to a patent for his discovery.

“We are of opinion that Golding’s method was a substantial improvement of this character, independently of particular mechanisms for performing it, and the patent in suit is valid as exhibiting a process of a new and useful kind.”

Applying the principles laid down in the above quoted decisions, we find that Harmatta did not invent the process or method of welding in spots, for that was old and well known before he entered the field and had been carried into practice by various forms of instrumentalities or apparatus.

He was not the first to conceive the idea of electrically welding overlapped or superposed metal plates or pieces at a relatively small contact spot instead of over the whole of their juxtaposed surfaces. Thomson, Robinson, Kleinschmidt, Benardos, Burton and others had done this before him, by the use of various forms of apparatus.

Even the forms of apparatus suggested by Harmatta for carrying into practice this process of welding in spots were not new. That form of apparatus which he elaborated with the greatest thoroughness and claimed most specifically in his application for patent as originally filed (and which, by the way, does not appear at all in the patent as issued) to wit, the form which involves the use of roller electrodes, was found by his solicitors to be anticipated, in substance, by the early Thomson and Lemp patents and, for that reason was jettisoned by them at an early day. His other form of apparatus, to wit, that involving the use of pin electrodes, is shown in the Benardos German patent of 1890, and in the Burton patent of 1900, which the Patent Office Examiner seems to have entirely overlooked.



**All of the Process or Method Claims of the Harmatta  
Patent Are Anticipated and Void.**

The method or process claims of the Harmatta patent read as follows (Rec. p. 389):

"1. The hereinbefore described improved method of fastening two pieces of metal together by electrically welding them to one another at spots only of their juxtaposed or opposite faces by the application of pressure and heating current localized in such spots.

"2. The herein described method of uniting two pieces of metal at a number of distinct or separate spots separated from one another by well defined areas of no union, consisting in applying pressure localized at the spots of desired union, and passing electric current through the pieces from one to the other while confining the flow of current to said spots until the union is effected.

"3. The herein described method of uniting two pieces of metal, consisting in pressing them together while passing a heating electric current from one to the other and localizing the flow of current and the heating throughout the operation in a spot or spots of circumscribed or limited area as compared with the area of the immediately opposed surfaces, so as to limit the union of the pieces to a spot or spots.

"4. The improved method of uniting two pieces of metal at a spot or spots only in their opposed meeting surfaces, consisting in pressing the two pieces together, and passing a welding electric current from one to the other while localizing the pressure in and confining the flow of current to the spot or spots of desired union so as to produce an isolated spot or spots of union, leaving distinct or well defined areas in which the pieces are not welded together.

"5. The method of uniting two sheet metal pieces together, face to face, consisting in pressing them together, and simultaneously with the pressure, passing an electric current from one to the other at isolated or distinct spots in the areas lapping or opposed, said spots being separated from one another by such a distance that there is a union of the sheets at spots entirely surrounded by the areas of no union.

"6. The method of uniting sheets of metals by pressing them together and at the same time passing a heating and welding current from one to the other at a spot on their meeting surfaces which is restricted in area throughout the operation so as to leave on the meeting surfaces a well defined and comparatively extensive area of no union completely surrounding said spot.

"7. The process of electrically welding thin metallic sheets, which consists in introducing the sheet metal parts to be welded between electrodes, pressing said electrodes firmly together and closing the circuit, whereby a small, sharply defined place of welding which answers the purpose of a rivet is obtained, substantially as set forth.

"8. The method of electrically welding two plates or sheets of metal together face to face between electrodes, consisting in restricting the area of contact of an electrode with said plates to a spot, passing a heating electric current from said electrode to the co-operating electrode through said spot to heat the work to welding temperature and applying pressure to the work in line with said spot to effect a welding of one plate to the other.

"9. The herein described method of producing a welding temperature in a small distinct spot or point of the opposed surfaces of two plates of metal, consisting in applying pressure at a point or spot only at the back of a plate coinciding with the desired point or spot of welding, while the plates are assembled face to face, to localize the

flow of current in the required point or spot in the meeting surfaces and passing an electric current through the plates in the line of the applied pressure to bring the material to welding temperature at the spot of welding by the resistance of the work to the passage of such current.

"10. The method of electrically welding a piece of sheet metal at a small distinct spot or point in its plane surface to the face of another piece of metal, consisting in applying pressure at a small point or spot on the back of the sheet to localize the pressure and electrical heating of the work at a spot of electrical contact in the opposed surfaces of said pieces beneath the point of applied pressure, and passing an electric current from one to the other at the said spot of localized electrical contact to produce a welding temperature at said spot and maintaining the localized pressure to effect a welding at said spot.

"11. The herein described method of welding two pieces of sheet metal together by a weld at a small spot only of their opposed surfaces, consisting in applying pressure localized in a spot on the back of a sheet directly over the desired spot of union, while said sheet is assembled face to face with the opposite sheet and so as to localize the pressure and electrical heating in a spot in the meeting surfaces of the sheets, and effecting the weld by passing an electrical current from one sheet to the other through said spot in the line of the localized applied pressure, and by pressure applied in said line.

"12. The method of electrically welding two pieces of sheet metal to one another, consisting in pressing the sheets together by pressure applied and localized in a distinct well-defined point or spot on the rear surface of a sheet while passing an electric current through them in the line of the pressure, thereby localizing the path of the heating current from one to the other of the meeting surfaces of the sheets to cause the said sheets

to be heated to welding temperature by the electric resistance of the work at said spot, and applying pressure localized over said spot whereby the pieces are welded together at a distinct well-defined spot in their meeting surfaces answering the purposes of a rivet.

"13. The method of electrically welding two plates of metal together face to face, consisting in pressing the plates together between two electrodes one of which at least makes contact with the rear of a plate at a spot only, feeding a heating electric current into the plates by said electrodes to bring the plates to welding temperature by the heating effect due to the electrical resistance of the portion of the circuit containing said plates, and effecting an electric welding of one plate to the other at a spot beneath the electrode by the pressure of said electrode.

"14. The herein described method of fastening two sheets of metal together at a distinct point or spot only in their plane meeting surfaces, consisting in pressing the sheets together and localizing the contact pressure of each upon the other at the said distinct spot or point, passing an electric current from one sheet to the other through said localized spot of contact pressure between them to bring the metal to welding temperature in said spot and thereupon completing the weld in the material so brought to welding temperature and uniting the pieces by a welded union at said spot only.

"15. The herein described method of fastening two pieces or sheets of metal together at a spot only in their meeting surfaces, consisting in pressing them together at said spot, passing an electric current through said pieces or sheets at said spot to raise the same to welding temperature and applying welding pressure localized in the back of a sheet immediately over said spot to effect the weld.

"16. The herein described method of welding two pieces of sheet metal together by pressing them together between electrodes engaging the surface of the sheets at a spot only and bringing the section of work between them to the welding temperature by its resistance to the passage of an electric current fed through the work by said electrodes."

Of these sixteen claims, the first six were taken bodily from the Rietzel patent. They were originally prepared by the astute counsel of the Thomson Company, after knowledge of the disclosures of the Harmatta foreign patents, to cover the spot welding of plane-faced plates or parts, as well as the union of plates or parts having pre-formed projections like Rietzel's, and they well accomplished that result.

Take claim 3, for instance, which reads:

"3. The herein described method of uniting two pieces of metal, consisting in pressing them together while passing a heating electric current from one to the other and localizing the flow of current and the heating throughout the operation in a spot or spots of circumscribed or limited area as compared with the area of the immediately opposed surfaces so as to limit the union of the pieces to a spot or spots."

But, unfortunately for the plaintiff, this claim not only applies to the disclosures of Rietzel and of Harmatta, but also to the disclosures of Thomson, Robinson, Kleinschmidt, Benardos and other prior workers in the art.

The same is true of the other method or process claims, as well those taken from the Rietzel patent, as those that were superadded after the termination of the interference with Rietzel to better cover Rietzel.

None of such superadded claims, however, expresses a patentable distinction over the claims taken from Rietzel, as examination will show. All of them are broad and all-covering and were intended so to be. Each reads upon the disclosures of Rietzel, and, by the same token, reads also upon the disclosures of Thomson, Robinson, Benardos, Burton, and others of the prior art and is anticipated and invalidated by the latter.

In this connection, the Court is respectfully referred to the very lucid discussion of the prior art by Mr. Dyer, defendant's expert. (Rec., pp. 546-614.)

**PLAINTIFF'S ABORTIVE EFFORTS TO DRAW  
DISTINCTIONS BETWEEN HARMATTA'S  
PROCESS OR METHOD AND THE PRO-  
CESSES OR METHODS OF THE PRIOR ART.**

Throughout their testimony the expert witnesses for the plaintiff have endeavored to draw distinctions between the process or method disclosed by Harmatta and that disclosed in the prior art, and to make out that Harmatta's process or method presents something radically new. But all such efforts are futile and will not bear analysis. They relate, in the main, to alleged differences in the apparatus or instrumentalities employed and the materials operated upon, and have no bearing at all on the questions of the novelty of the process or method, as such.

Some of these attempted differentiations will now be briefly discussed.

**Roller Electrodes and Pin Electrodes**

(1) On this point, it is first to be observed that Harmatta himself in his United States application,

as originally filed, as well as in his Canadian application, and in his British (Rec., p. 1124) and French (Rec., p. 1144) patents, draws no distinction at all between the process or method practiced by the use of pin electrodes and that practiced by the use of roller electrodes. He tells us that his electrodes, whether of one form or the other, may be made to approach and recede from each other, at will, so as to apply pressure and current to the interposed metal plates or parts to form the welds. With his roller electrode apparatus it goes without saying that he may either weld a continuous uninterrupted seam or, by opening and closing the rollers and shifting them, or the work (both methods are indicated as practicable in his original disclosure), he may make welds at distinct isolated spots as far apart as desired, having areas of no weld between them.

Defendant's expert, Mr. Dyer, says this may be done, and plaintiff's expert, Mr. Gravell, admits it. (Rec., p. 104.)

Harmatta, in his original United States specification, fully appreciated that the use of roller electrodes involved no essentially different operation, nor the consumption of any more current, than the repeated use of straight pin electrodes, for he says (Rec., p. 1358.):

"Fig. 2 is a front elevation and Fig. 3 a side elevation of a device which may be employed for continuous welding, the pressure being exerted by roller electrodes, whereby the *advancing series of single points* of the seam to be welded is united to a whole with a minimum consumption of current."

(2) The prior Thomson patent No. 444,928 (Rec., p. 1047), and the prior Lemp patent, No. 533,923 (Rec., p.

1065), both show roller-electrode welding apparatus in which the electrodes are, and are intended to be, adjustable toward and from each other, the same as in the Harmatta roller-electrode apparatus, and the same capacity to weld continuously by an "advancing series of single points" or at separated points or spots, is found in all of them. The Thomson patent, as we have seen, tells us that, first, one spot is welded and then, thereafter, a continuous welding takes place (Rec., p. 1048, bottom of column 2), the language used being "so as to bring successive parts of the joint into position to be pressed and heated at the same time."

As instrumentalities for practicing the process or method of, so-called, spot welding, the roller electrodes are, therefore, as competent as straight pin-electrodes.

Whether or not it be claimed for Harmatta that the devising of his pin-electrode apparatus involved a mechanical improvement or improvement in *apparatus*, it certainly cannot be justly contended that the use of such pin-electrode apparatus involved the practice of a different art, process or method from that involved in the use of a roller-electrode welding apparatus whose rollers were openable and closable, at pleasure, on the work.

Plaintiff's counsel, in the early stages of the case, tried to establish that the use of roller electrodes in a welding apparatus was entirely impracticable, but the testimony on both sides turned out so overwhelmingly against them, on this point, that they probably will not renew the contention again. (Dyer, Rec., p. 583; Gravell, Rec., pp. 103, 104, et seq.; Knapp, Rec., p. 221; Knapp, Jr., Rec., p. 233, et seq.; Clark, Rec., p. 263; Thomson, Rec., p. 533.)



But to Harmatta does not belong the distinction of even having first devised a pin-electrode apparatus. The German patent to Benardos (Rec., p. 1152), and the United States patent to Burton (Rec., p. 1081), show such form of apparatus employed to electrically weld, at spots, overlapped or superposed plates or pieces of metal by a process or method identical with that claimed by Harmatta.

As to the form of pin-electrodes, much has been said in the testimony offered in behalf of the plaintiff in regard to the merits of pin-electrodes with pointed ends. In Figs. 1 and 2 of the Harmatta patent the electrodes happen to be shown pointed but in the actual practice of spot welding two (2) pointed electrodes are seldom used except to weld tin and like metals of low fusibility. Figs. 3 and 4 show electrodes of other forms. The machines brought from Germany in 1904 and installed at the factory of the National Enamelling and Stamping Co., and claimed by plaintiff to be Harmatta machines, though not proven to be such, had electrodes of uniform diameter throughout, with blunt ends (Knapp, Rec., p. 129; Herring, Rec., p. 132).

If there is anything in tapering or rounding the ends of electrodes the Burton patent and the German patent of Benardos show it (Rec., p. 1151), and these antedate Harmatta.

### Thickness of Plates or Parts Operated Upon

Now and again in the testimony offered by the plaintiff will be found glowing tributes to the capacity of Harmatta's pin-electrode apparatus to unite by welding in spots, very thin sheets of metal. But these are tributes to *apparatus* and not to process or

method. The same process or method is involved in the use of any roller electrode apparatus, whether of Harmatta's invention, or of the invention of Thomson or of Lemp or of anybody else upon plates of *any* thickness. The thickness of the plates operated upon has, therefore, nothing to do with the novelty of the broad process or method under discussion.

That process or method, as shown by the evidence on both sides, is applicable to the union of metal plates or pieces regardless of their thickness.

Mr. Dyer testified he had successfully spot-welded a cold-rolled steel plate  $1/32$  of an inch thick to a  $1/2$  inch bar (Rec., p. 603). Mr. Gravell, plaintiff's expert, admitted that the Harmatta patent is not limited to the welding of plates or pieces of any specific thickness (Rec., p. 77); that he has seen plates  $3/8$  of an inch thick spot-welded together (Rec., p. 79, X-Q. 78) and that theoretically there is no limit to the thickness of material that may be spot-welded (Ibid, X-Q. 80). Prof. Thomson testified to the spot welding of plates of from  $3/8$  to  $1/2$  inch in thickness (Rec., p. 541). The catalogue issued by the Universal Welding Co., licensee of plaintiff's predecessor marked Defts. Ex. 10 says: "We can spot weld any gauge of material from the lightest gauge up to one inch thick." There was not in the United States application of Harmatta, as originally filed, any limitation placed on the thickness of the plates that could be successfully welded by the Harmatta apparatus, of either form. Nor does any such limitation appear in the Harmatta patent as granted.

During the prosecution of his United States application, when it was doubtful whether, even in view of the very limited prior art that had been cited by the Examiner, any novelty whatever could be found in

Harmatta's disclosure, an amendment was filed limiting the scope of the Harmatta invention to an apparatus for the union of sheets of "from about two millimeters in thickness downwards" (Rec., p. 1375) though there was no such limitation suggested in the original Harmatta application. Two millimeters is about  $2/25$  of an inch.

In the interference that was subsequently declared between Rietzel and Harmatta, it was stoutly contended by the plaintiff's predecessor, then the owner of the Rietzel patent, that such limitation was an admission that the spot welding of plates or sheets of more than two millimeters in thickness was not of Harmatta's invention and, consequently, an admission that the broader claims made for Harmatta and involved in the interference were claims that Harmatta was not entitled to make and to which he had made no oath of invention. (See brief of Rietzel, Rec., p. 1860.)

This contention was overruled, with the result that, as above indicated, the patent issued to Harmatta without any limitation as to the process or method being confined to the union of plates or parts of any specific thickness. We make mention of this matter here, to show upon what a narrow basis the alleged invention of Harmatta was once supposed by plaintiff's predecessor to stand.

However, all that may now be urged as to the adaptability of the Harmatta process to the union of extremely thin and flexible sheets of metal is quite beside the mark, since the matter in controversy is a process applicable, broadly, to plates or pieces of whatever thickness.

Moreover, the processes disclosed in the prior patent to Thomson, Lemp, Benardos, Burton, and others, are stated to be specifically applicable to the union of

thin sheet metal plates. This is especially true of Thomson, who, in his patent, No. 496,019, speaks of the use of his apparatus to unite *thin* tinned iron plates (Rec., p. 1055), and of Benardos, who in his patent says his "process may serve to directly weld together relatively *thin* metal sheets," etc. (Rec., p. 1152.)

### Character of Current

Harmatta nowhere specifies the kind of current he intends to employ. It is *assumed* that he contemplated using a current of large quantity and low tension, as such a current is proper for welding.

Thomson, Robinson, Kleinschmidt, Burton and Benardos were, however, careful to tell us the kind of current they employed, being in this respect specific, where Harmatta is silent.

### Electrode Materials

Harmatta nowhere tells us of what materials his electrodes—whether pin or roller—are to be made—whether of high or low resistance substances. If for the practice of, so-called, spot welding, necessity exists for the use of electrodes of any given material, he does not disclose it.

If necessity exists for the use of electrodes of relatively low resistance, instead of relatively high resistance, he does not disclose it. If necessity exists for the employment of electrodes whose resistance bears any special relation to the resistance of the parts to be united, he does not disclose it. If necessity exists for the use of electrodes that do not heat or heat much he does not disclose it. If necessity exists for effecting the welding by heat developed by the internal resistance of the parts to be united alone, instead of partly

in the electrodes themselves, he does not disclose it. If necessity exists for effecting the welding by heat developed principally at the joint between the parts to be united, he does not disclose it.

If the welding of metal plates can be effected by the use of electrodes of relatively high resistance (and the Thomson patent, No. 496,019, the Benardos patent, No. 50,909, the Stanley patent 1,176,614 and the uncontradicted tests of Mr. Dyer demonstrate that it can) (Rec., pp. 565, 601, 613), then the Harmatta patent hasn't a leg to stand on, for it gives no indication of any particular resistivity, relative or otherwise, and, in the absence of any directions on this subject, the use of all electrode materials must be held to be within the scope of the disclosure.

The above observations have relation to the disclosure of Harmatta's application as originally filed, which, alone, he swore to, as embodying what he claimed to be his invention. Any substantive matter introduced afterward by amendment and without his sanction and oath is, of course, without value.

The folder found opposite this page is inserted to illustrate, graphically, the relative resistances and conductivities of the electrodes and of the work in the Thomson patent No. 496,019, the Benardos German patent, the Harmatta French patent, the Stanley patent, and in the Harmatta U. S. patent in suit. It will be seen that where electrodes of high resistivity and low conductivity are used to weld plates of lower resistivity and higher conductivity, the disclosures of Thomson (Fig. 7) and of Benardos and of Stanley correspond, and that where, on the other hand, electrodes of low resistivity and high conductivity are used to weld plates of higher resistivity and lower conductivity, the disclosure of Thomson (Fig. 22) and of Har-

matta French patent, with iron or copper electrodes, and of Benardos, correspond. It will also be seen that the resistivity and conductivity of neither electrodes nor plates are given in the case of the Harmatta U. S. patent, the materials of these parts being undisclosed in the patent.

### Materials to Be United By Welding

Turning to the original application of Harmatta, as filed, we find that he refers to the welding of "metal articles of all kinds in particular those of thinner sheet metal"; to "two metal sheets of equal thickness"; to "two sheet metal or other bodies"; to "sheets of metal only at particular places"; to "two superposed sheet metal ends"; to "thin vessels which are required to stand great pressure"; to "objects to be welded." But he nowhere tells us what kind of sheet metal he proposed to weld.

The absence of any particular designation in this regard would seem to indicate that the welding of all kinds of sheet metal would fall within the scope of his conception. This would, of course, include sheets of tin or of tinned iron. If sheets of either of these materials (which are of low fusibility) were employed, then electrodes of graphite or carbon, such as suggested by Benardos, in his patent 50909 or by Thomson in his patent No. 496,019, would suffice to fuse the surfaces of the sheets at the points of contact and result in perfect welds, and would fall within the claims in question.

In this connection, it is to be noted that in the Harmatta (Egel) French patent of October 13, 1903 (Rec., p. 1140), the welding of sheets of tin (tinned iron) is thrice referred to, and no other metal is mentioned as follows:

*Original (p. 1141)*

"Ansi que le montre la fig. 1, on introduit les deux corps metalliques (*fer-blanc* ou autre) dont les extremités se recouvrent, entre les deux electrodes a b."

Again,

"Si alors on amene, par exemple, deux extremités de *fer-blanc* qu'il s'agit de souder et quie se recouvrent reciproquement entre les electrodes," etc.

And, again, in claim 2, as follows:

*(p. 1142)*

"2° Deux electrodes en forme de galets, tenons ou autres, entre lesquels on introduit les objets a souder (*fers-blancs* ou autres), dont l'une puet etre rapprochee ou ecartee de l'autre au moyen d'un levier, excentrique ou autre dispositif, actionne par une cremaillere ou autre dispositif."

*Translation (p. 1145)*

"As shown in Fig. 1 the two metallic objects (*tin* or the like) are introduced with their ends overlapping between the two electrodes *a* and *b*."

"If then, for example, two ends of sheet *tin* which are to be welded and which overlap each other, are placed between the electrodes," etc.

*(p. 1146)*

"2. Two electrodes in the form of rollers, pins or the like between which are introduced the objects (*sheet tin* or the like) to be welded, one of which electrodes may be approached towards or separated from the other by means of a lever, eccentric or other device, actuated by a rack or other means."

The term "*fer-blanc*" occurring in the text of the French patent (*ibid.*, pp. 1141, 1142) has been rendered "*tin*" by Mr. Coombs in his translation (*Rec.* pp. 1145, 1146). It really means tin plate or tinned iron;

but in common parlance, we refer to tin plate or tinned iron as "tin." For example, we speak of tin plates, tin cups, to designate tin-coated iron plates or cups; or we say "tinned goods," meaning food put up in so-called "tins," e. g., receptacles made of tin-coated or tin-plated iron.

The French word for pure tin is "étain."\*

It is certainly very significant to find the French patent specifically mentioning tinned iron only, as the material proposed to be welded, since it indicates that electrodes of relatively high resistance, such as indicated by Thomson in his patent No. 496,019, or by Benardos in his patent No. 50,909, would be competent to carry out, and be well within, Harmatta's conception.

On the sound principle of patent law, that what would be an infringement, if later, would be an anticipation, if earlier, the Harmatta claims clearly cover, and just as clearly are anticipated by, the disclosure of the Thomson patent No. 496,019, which shows iron electrodes or carbon-faced copper electrodes, employed to electrically weld the tin-coated iron plates mentioned by Harmatta.

We do not, of course, know what the fact was, but we venture the suggestion that the two machines that were imported from Berlin, in 1905, by the National

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\*"Heath's French Dictionary," D. C. Heath, Boston, 1903. Tin, n. (Chem.) étain; (sheet iron coated with tin) fer-blanc.

Fer-blanc N. M. (-s-s) tin, tin plate, latten.

"*Mothes' Dictionnaire Technologique*," Wisbaden, 1874. Etain—tin. Fer-blanc m.—tinned iron-sheet, tin plate.

"*Spiers & Surrennes French and English Pronouncing Dictionary*," S. Appleton, N. Y. 1915. Fer-blanc n.m.—tin plate; tin; latten.

"*Clifton & Grimaux*," Library Garnier, Paris, 1914. Fer-blanc s. m.—tinned iron; tin-plate; tin; a thin plate of iron coated with tin.



Enameling & Stamping Co., were procured, primarily, for the purpose of welding tinned iron.

Mr. Knapp, the Director General of the company, testified that "The ordinary welding in a tin factory is just as *strong* as the ordinary riveting that has been done heretofore" (Rec., p. 128, X-Q. 55); but he then went out of his way to take a slap at the welding of tin ware, saying:

"To weld tin ware it makes a black spot and burns the tin and in sheet iron or sheet steel it does not make that spot. The extreme heat at which welding is done does not interfere at all, where it would burn tin." (*Ibid*, p. 128, Re-D. Q. 57.)

It may be that in the welding of tin ware, when unskillfully done and without a proper regard to the strength of current used, the work might sometimes, as Mr. Knapp suggested, show a discoloration, but that would affect the appearance and not the strength of the weld.

When Mr. Knapp went out of his way to criticise the welding of tin ware, he evidently had not heard of the Harmatta French patent, and, therefore, did not know he was condemning the only specific application of electric welding—the welding of tinned iron—to be found in any of the Harmatta disclosures!\*

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\*The spot welding of sheets of tin or of tin-coated iron presents no difficulty.

In the standard publication entitled, "Electric Welding," by Hamilton & Oberg, under the title "Spot Welding," occurs the following statements (p. 95):

"Tin can be welded to tin or to sheet iron, but the stock will be discolored at the weld (p. 97)."

"In welding brass, galvanized iron, tin, terne plate, German silver, aluminum, sherardized steel and all coated materials, it is advisable to use less pressure between the electrode points (p. 98)."

"In welding tin, lead, or zinc-coated iron, both the upper and lower electrodes are pointed."

See also mention of tinned ware in agreement with Silesia Company, Rec., p. 433.

Mr. Gravell, plaintiff's expert, admitted the accuracy of these statements (Rec., p. 193, X-Q. 35).

Mr. McBerty has made and offered in evidence specimens of spot welding showing the practicability of spot welding tinned iron plates by both copper and steel electrodes (Rec., pp. 1014, 1015).

### Extrusion of Metal

Realizing the straits in which it finds itself, plaintiff has endeavored, through its experts, to build up a theory of difference between the process or method involved in the welding of plane-faced plates and that involved in the welding of plates, like those of the Rietzel patent, in which one or both of the plates is or are provided with slight projections, founded upon what plaintiff is pleased to call the "extrusion of metal."

The theory has nothing substantial to support it. If there is extrusion of metal in one case, there is also in the other; but in any case it is negligible. The probabilities are that there is always and inevitably a slight extrusion of metal, if by extrusion we mean the lateral displacement of the metal at the point of fusion or welding under the pressure applied by the current-carrying pressure electrodes (Dyer, Rec., pp. 580, 586, 605).

Suppose we wish to weld a very thin metal plate provided at intervals with very small, short projections, or protuberances, to another metal plate having a practically plane face, as suggested by the Rietzel patent (Fig. 3). If, now, we lay these two plates together with the small projections or protuberances of one resting against the plane face of the other and then clamp them between two current carrying elec-

trodes with sufficient force to produce intimate pressure at the places of contact between the plates, and then turn on the current, it is clear that when the heat generated at the places of contact becomes sufficient to raise the temperature of the metal at those places to the fusing or welding point, the continued pressure of the electrodes will permit them to approach slightly nearer each other and, in so approaching, cause, possibly, a slight lateral displacement or flow of the softened metal of the plane-faced plate, on the one hand, and of the projections or protuberances of the counter-plate, on the other. This lateral displacement in the case of very thin plates having very low projections or protuberances will probably be immeasurably small and, in any case, entirely negligible.

When Mr. Townsend, plaintiff's counsel, was describing the disclosure of the Rietzel patent, he wrote (Rietzel patent No. 928,701, p. 1, line 92, Rec., p. 1099):

"In carrying out my invention the *localization* of the flow of *heating electric current* and of *welding pressure* to the desired spot or spots may be brought about in any desired way. One of the preferred ways is by providing between the meeting surfaces or portions of the pieces to be united suitable conducting projections or points at the spots of union, which projections or points carrying the heating electric current from one piece to the other are so located in the meeting surfaces and are so separated from one another that on the application of the welding pressure *the welded union resulting will be localized in the area of the opposed surfaces and will be substantially co-extensive in area with the restricted area of the path of the effective heating current.*"

This, from plaintiff's own camp, seems to contradict the idea of there being any material extrusion of

metal. If the "welded union" is "localized on the area of the opposed surfaces" and "substantially co-extensive in area with the restricted area of the path of the effective heating current," there can be substantially no extrusion.

Suppose, now, we wish to weld together two very thin plane-faced sheets or plates of metal by means of, say, a flat electrode on one side and a pointed electrode on the other. If, in such a case, we lay the overlapped sheets of metal between the electrodes and then cause the electrodes to approach one another, the plates will be pinched between the electrodes and the pointed electrode will, to a slight degree, bend or strike up the metal of the sheet against which it bears and, in effect, form a projection thereon (Dyer, Rec., p. 585), and if current is now turned on and maintained till the temperature of the parts of the plates that are thus brought into contact by the action of the electrodes reaches the fusing or welding point the softened metal will permit the electrodes to still further approach which will doubtless cause the softened metal to be slightly displaced or extruded, laterally—not to a degree that is of any moment, but, theoretically, somewhat.

Professor Thomson, who was swearing as hard as he could for the plaintiff company, of which he is vice-president and director, was obliged, reluctantly, to admit that in spot-welding there is "a *slight* movement of the metal" and that only "*practically all*" of the metal is included in the weld, as the following from his deposition shows (Rec., p. 535):

"Q. 41. Are you prepared to say that there is no extrusion of metal at all, in the sense in which you have used that term in the making of a spot weld, so-called?

"A. There is a *slight movement* of the metal, but it is not manifested as an extrusion. The plates appear after the welding slightly indented or practically flat. The indentation, of course, means that the metal has *moved* but *practically all* of the metal is included in the weld, framed around by the unwelded material which being on edge opposes a very high force in the *spreading*." (Italics ours.)

By "manifested," Prof. Thomson may have meant "could not be seen," which, of course, would be usually true, as the welds are between the plates and out of sight.

Mr. Gravel, plaintiff's expert and general "stop gap" (having been put on the stand for the plaintiff five or six times), also found it necessary to step very lightly in regard to there being no displacement or extrusion in spot welding, so-called.

He testified on cross-examination, the first time he was produced, as follows (Rec., p. 85):

"X-Q. 118. Assuming that in spot welding the electrodes are placed firmly against the superimposed plates with no current on and that then, while the pressure continues to be applied, current is turned on and maintained until a proper welding of the plates has been effected, and that the current and pressure are then removed, will not the aggregate thickness of the plates at the point of pressure and welding be less after the completion of the weld than before?

"A. There is a slight depression at the weld which would make the aggregate thickness slightly less.

"X-Q. 119. I take it that very slight decrease in thickness is due to the heat and pressure involved in the welding operation. Is that not so?

"A. Yes.

"X-Q. 120. What has become of that displaced metal which the heat and pressure have displaced?

"A. Sometimes there is noticeable upset around the tool which has created the pressure. The amount of depression is usually so slight *that it is very difficult to say what becomes of the metal.* The condition is very similar to pressing any piece of metal with a blunt tool, either the metal must be upset or condensed.

"X-Q. 121. In ordinary spot welding is the metal softer at the contact point between the plates than it is at the point of contact between the electrodes and plates?

"A. In all probability while the metal is in the hot condition the greatest heat is at the center of the plane surface which is in the process of welding, because heat is continually flowing from this hot place to the surrounding metal, which is relatively cold. As the degree of softness is the function of the temperature, it naturally follows that the softest part of the metal would be located on the surfaces of the sheets between the sheets at the center of the heated spot.

"X-Q. 122. And if there is any flowage of metal, due to compression, it ought to take place in the greatest degree where it is softest, that is to say, at the proximate faces of the plates, ought it not?

"A. This would be the case if the metal were not confined, but as the spot heated for welding is entirely surrounded by relatively cold metal, we can hardly think of the metal as flowing out or moving, except in so far as it is pressed strongly against itself, owing to the expansion due to the heating."

It is remarkable that a most careful examination of the original application of Harmatta fails to disclose any mention of the absence of extrusion of metal in the practice of his process or in any product or article that might result from the practice of his process.

But it is more remarkable still, that in the Harmatta patent itself, the final draft of the specification and claims for which was prepared by Mr. Townsend—the Thompson Company's expert-of-experts in specification writing—there is not the slightest allusion to extrusion or the absence of it or to anything akin to it, either in the description of the process or in the description of the product.

It is, therefore, perfectly plain that the present exploitation of "the extrusion theory" represents a belated attempt on the part of the plaintiff to advance a point of differentiation which does not exist, and which, if it did exist, would be insubstantial and negligible.

What would it matter, we beg to inquire, if there were a slight extrusion or flowage of metal laterally from the place of welding of superposed sheets of metal, whether such sheets had projections or plane surfaces? In either case, the places of welding would be out of sight and there could be no possible disfigurement of the work nor impairment of the welds, and, in either case, the process of so-called spot welding would be produced.

None of the claims of the Harmatta patent refers to extrusion of metal or the lack of it, and each is broad enough to cover a process or method of operation which would be practiced whether or not extrusion occurred. The plaintiff must stand or fall by the claims as made, and can neither add anything to them nor subtract anything from them.

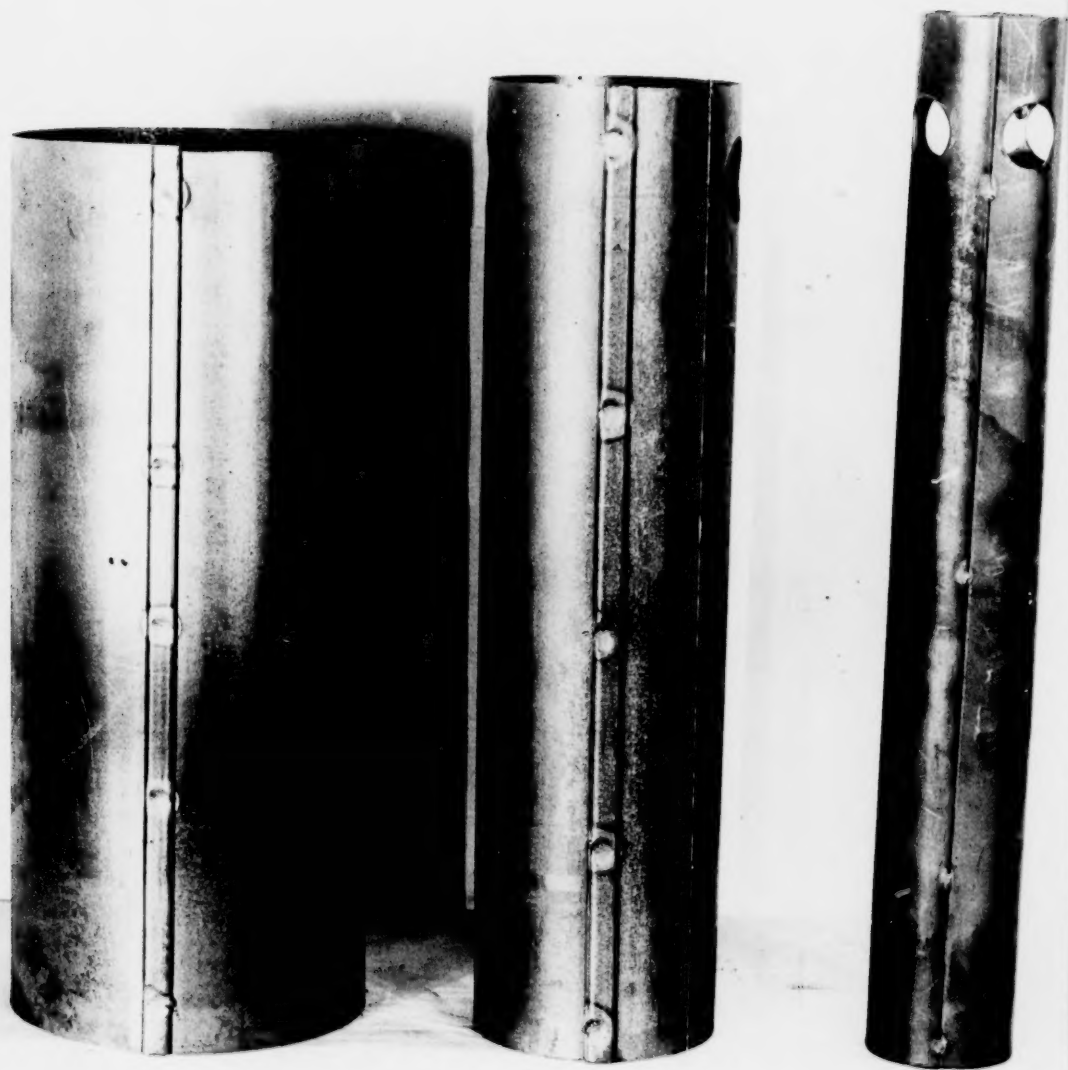
We repeat: The claims cover and were drawn to cover the welding of plates having pre-formed projections on one or both of them, such as disclosed by Rietzel, as well as the welding of plane-faced plates, and they are, therefore, anticipated and invalidated by the prior patents of Robinson, Kleinschmidt, de Ferranti and others.

If it is contended that any of them is limited to the welding of plates which have no projections on them, then that claim is anticipated and invalidated by the prior patents to Thomson, Lemp, Burton, Benardos and others, and is further invalidated on the ground that such a claim does not present a process or method that is substantially and patentably different from the process or method involved in the welding of plates provided with pre-formed projections.

The photograph opposite shows some of the practical applications of spot welding made at defendant's factory. It is a copy of Defendant's Exhibit No. 49, Dyer Photographs Sheet A-2, referred to by Mr. Dyer, in his testimony. (Rec., p. 584.) It will be noted that where the welds are made close to the edge of the lapped parts there is a slight lateral displacement or extrusion of the metal, but this does not affect the character of the weld nor involve any departure from the process employed to make it.

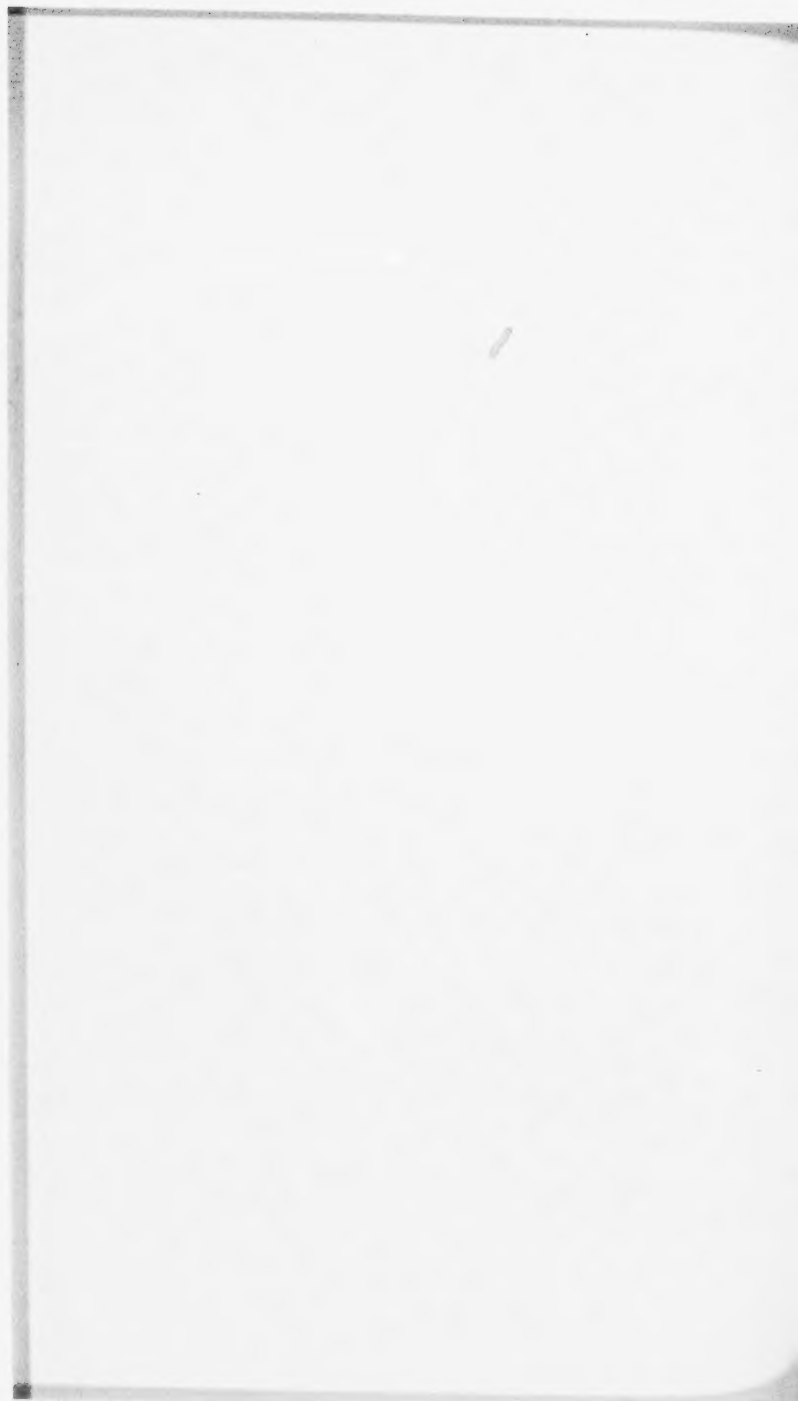
In this connection attention is called to the fact that in Plaintiff's Exhibit No. 2, attached to plaintiff's interrogatories, which is a spot welded muffler tube of defendant's manufacture and is claimed by plaintiff to support the charge of infringement, in this case, there are four welds indicated. (1) The first weld (next the perforations in the muffler) shows the impression of the pointed electrode about one-eighth of an inch from the edge of the overlapped top part and no extrusion of metal appears; (2) the second weld shows a slight extrusion of metal; (3) the third weld shows slightly more extrusion; and (4) the fourth weld shows much extrusion. A photograph of this plaintiff's Exhibit No. 2 is shown opposite.











BECAUSE OF THE BREADTH AND INCLUSIVE-  
NESS OF THE HARMATTA PRODUCT OR  
ARTICLE CLAIMS THEY ARE ANTIC-  
IPATED AND INVALIDATED BY THE  
PRIOR PATENTS OF ROBINSON, KLEIN-  
SCHMIDT, BENARDOS AND OTHERS.

Interpreted as they must be, *in view of their origination in the Rietzel patent*, as covering and including products or articles formed from plates or parts one or both of which are provided with pre-formed projections, all of the product or article claims of the Harmatta patent must be held to be invalid in view of the prior patents to Robinson, Kleinschmidt, Benardos, and others.

The *Robinson Patent* No. 574,942, of January 12, 1897, not only shows and describes the welding of plates or parts, one of which has pre-formed separated welding projections, but, as we have seen, makes distinct claims for such subject-matter, as follows (Rec., p. 1074):

"7. In a rail-joint, the truss or bottom plate B provided with the welding projections *d d*, with space between them, said projections being adapted to form several welding connections with the same rail, substantially as described.

"8. In a rail-joint, a splice-bar constructed for welded attachment to one only of the abutting rails, said bar being provided with a plurality of welding projections grouped nearer to one end of said bar than the other, said projections forming a plurality of welding connections with the same rail, the portion of said splice-bar between said projections, and not raised to a welding heat, limiting the compression and regulating the predetermined relative position of said splice-bar and rail when welded together, substantially as described."

The characteristics of the Robinson structure set out in these quoted claims were urged by Prof. Thomson as peculiar to the Rietzel structure in an affidavit made by him and filed in support of the Rietzel application.

Prof. Thomson in that affidavit (verified November 30, 1908) said, among other things (Rec., p. 1784) :

“That in the invention of Mr. Rietzel aforesaid  
 \* \* \* the purpose is distinctly to limit the welding to a mere spot or spots, forming, in effect, a substitute union for that made heretofore, by perforating the plates at the spot or spots of union and then inserting a rivet and heading down said rivet.”

Again (*Ibid*) :

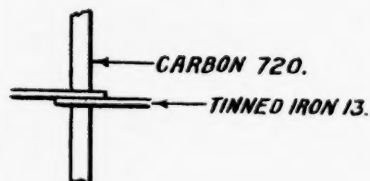
“That in the Rietzel invention, in other words, the mechanical union of the plates is not over the whole area of the opposed or meeting surfaces, but at a number of isolated places which are, strictly speaking, spots, inasmuch as the welding portions of the plate form portions only of their meeting surfaces and are separated from one another over large areas by disunited portions, said disunited areas being anything desired consistent with the desired strength of the composite piece.”

Again (*Ibid*, p. 1785) :

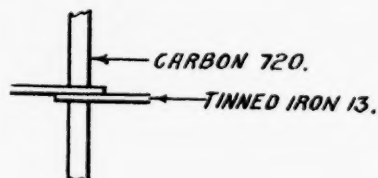
“The spot welding as contemplated by the Rietzel invention is entirely different in conception and application and affords a welding substitute for a riveted union. There is no welding over the areas between the spots at which the heating current starts and in fact there may be such a want of contact and union over such areas as to allow a liquid to leak through between the plates, etc.”

	<u>Resistivity</u>	<u>Conductivity</u>
COPPER	1.586	100.
IRON	8.85	17.9
IRIDIUM	6.1	26.
MAGNESIUM	4.35	36.2
TIN	13.0	12.2
PLATINUM	10.96	14.4
SILVER	1.46	108.
TUNGSTEN	5.57	28.8
CARBON	720.	

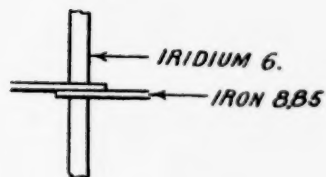
Thomson (1889)



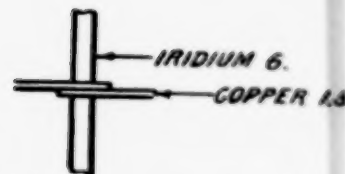
Benardos (1890)



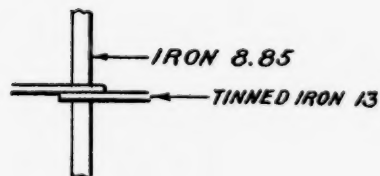
Benardos (1890)



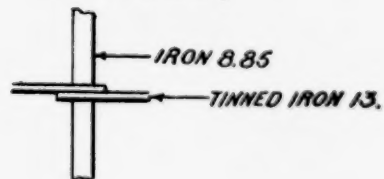
Benardos (1890)



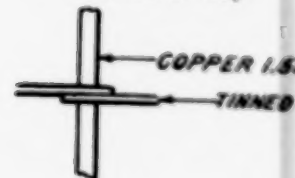
Thomson (1889)



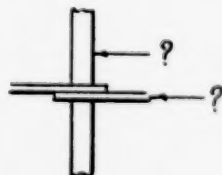
Harmatta French  
(Oct. 1903)



Harmatta French  
(Oct. 1903)

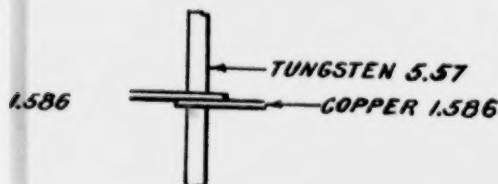


Harmatta U.S. (Dec. 1903)





Stanley (1916)



# EXPLANATION.

In this diagram, the illustrations in the upper line, reading from left to right represent, the first one in order, Fig. 7 of the Thomson patent 496,019, wherein the electrodes (carbon) are of relatively high resistance (720.) while the plates (tinned-iron) are of lower resistance (13.); the second, Fig. 2 of the Benardos German patent, wherein, also, the electrodes (carbon) are of relatively high resistance (720.) and the plates (assumed to be of tinned-iron) are of lower resistance (13.); the third, Fig. 2 of Benardos, wherein the electrodes (iridium) are of relatively low resistance (6.) and the plates (assumed to be of iron) are of higher resistance (8.85); the fourth, Fig. 2 of the Benardos patent, wherein the electrodes (iridium) are of relatively high resistance (6.) and the plates (assumed to be of copper) are of lower resistance (1.586); and the fifth, Fig. 4 of the Stanley patent, wherein the electrodes (tungsten) are of relatively high resistance (5.57) and the plates (copper) are of lower resistance (1.586).

The illustrations, in the second line, reading from the left represent, in order, first, Fig. 22 of the Thomson patent 496,019, wherein the electrodes (iron) are of relatively low resistance (8.85) and the plates (tinned-iron) are of higher resistance (13.); the second, Fig. 1 of the Harmatta French patent, wherein the electrodes (assumed to be of iron) are of relatively low resistance (8.85) and the plates (tinned-iron) are of higher resistance (13.); the third, the same Fig. 1 of the Harmatta French patent, wherein the electrodes (assumed this time to be of copper) are of relatively low resistance (1.586) and the plates (tinned-iron) are of higher resistance (13.).

The illustration on the third or bottom line represents the electrodes and plates of Fig. 1 of the Harmatta U. S. patent, concerning which no hint is given either as to the materials or resistances employed.



We might here observe that the Robinson patent under consideration was not cited during the prosecution of the Rietzel patent application. The fact that it was classified among "rail joints" would account for the fact that it was overlooked by the Examiner.

The *Kleinschmidt Patent*, No. 616,436, of December 20, 1898 (Rec., p. 1077), affords another complete anticipation of the product or article claims of Harmatta. Kleinschmidt, like Robinson, had for his object the welding of splice-bars to the webs of railroad rails. His splice-bars were generally plane-faced, but each had a relatively low projection near each end and a third low elongated projection extending across the face of the bar, at the middle.

To secure the splice bars to the webs of the rails the bars were first clamped to the webs, with their isolated projections against the latter, by means of electrodes, and the welding current was then turned on and maintained till the union was complete.

There were large areas of unwelded union between the welded projections.

This Kleinschmidt patent was likewise overlooked and not cited to Rietzel.

The prior *Benardos German Patent*, No. 50,909, of May 8, 1889 (Rec., p. 1148), affords another complete anticipation of the product or article claims.

In considering this Benardos patent, in its application to such product or article claims, it is, of course, immaterial by just what process or by what form of apparatus the Benardos product is produced, so long as the product, as such, is the same as Harmatta's.

If we take the apparatus of Fig. 2 of Benardos, place two overlapped metal plates between the electrodes, clamp the plates by means of the electrodes and turn on the current, as directed, the result will be the weld-

ing together of the plates at the spot or spots treated and the production of a product or article that answers the call of the Harmatta claims. And this will be true, whether the greater portion of the welding heat is generated at the contacting surfaces of the two plates, in the plates themselves, in the electrodes or in all of these places. This Benardos German patent was also not cited to Rietzel.

The product of the *Thomson Patent*, No. 396,015 (Rec., p. 1038), answers the terms of the Harmatta product claims for, in addition to the union of the plates by rivets, electrically set, the plates themselves are welded in spots.

The sixth claim of the patent makes this clear:

“6. The herein described method of fastening two pieces of metal together, consisting in passing a heating current through a rivet or rivet blank passing through the pieces, *as well as through the pieces of metal themselves in the neighborhood of the rivet*, and applying pressure to set the rivet and weld the pieces together.”

So, with the product of the *Thomson Patent*, No. 444,928 of January 20, 1891 (Rec., p. 1048), overlapped pieces to be welded when subjected to the action of the roller electrodes which apply both pressure and current, will inevitably be converted into a product falling within the terms of the Harmatta claims.

The Thomson patent says (p. 1, line 84):

“The edges are slightly overlapped, as shown, and the plates, being in position between the rolls, may be squeezed together by means of the screw S, thus forming an electric contact between them. The electric current being now turned on as it passes from one roller to the other and across *the*

*point of pressure* will heat the work to the welding temperature and soften the same slightly, after which the screw may be driven a few more turns to effect a solid union.

"The work, *having been thus started*, may now be moved along through or between the rollers, *so as to bring successive parts of the joint* into position to be pressed and heated at the same time."

The *Lemp Patent*, No. 553,923 (Rec., p. 1067), affords another example of a product which falls within the terms of the Harmatta claims.

This patent is even a better reference than the Thomson patent last above considered, since, if there is anything material in the point, the roller electrodes of Lemp indubitably *do not*, in their position of operation upon the overlapped or superposed plates, extend way across the overlapped or superposed parts, *but only part way across*.

The *Thomson Patent*, No. 496,019 (Rec., p. 1055), which shows and describes the electrode welding of tin-coated iron plates, affords still another example of an anticipating product.

Other illustrations of products or articles answering the terms of the claims are found in the *Burton Patent*, No. 647,694 (Rec., p. 1079); the *Perry Patent*, No. 670,808 (Rec., p. 1083); the *Parkinson British Patent*, No. 14,836 of 1894 (Rec., p. 1112), and the *de Ferranti British Patent* of May 25, 1903 (Rec., p. 1122). The trial court and the Circuit Court of Appeals, in their written opinions, discussed with fullness the prior art patents above specifically referred to and concluded that they rob the Harmatta disclosures of both process and product of any patentably novelty (pp. 27-36, 2089).

**BY THE CONDUCT OF PLAINTIFF'S PREDE-  
CESSOR IN TITLE, PLAINTIFF IS EQUIT-  
ABLY ESTOPPED TO ASSERT HAR-  
MATTA'S PRIORITY OVER RIETZEL.**

On the 24th day of February, 1905, Adolph F. Rietzel, of Lynn, Mass., then the superintendent, engineer and general manager of the Thomson Electric Welding Company, plaintiff's predecessor, for and in behalf of his company, made application for a United States Patent for what was characterized as "Improvements in Uniting the Component Parts of Composite Sheet-Metal Structures."

In this application, as originally filed, it was stated (Rec., p. 1723):

"My invention relates to a method of forming an electrically welded union between the plane surface of a piece of metal and another piece of metal and is especially useful in uniting *two plates or sheets of metal at their plane surfaces.*

"One of the special objects of the invention is to provide a method whereby a sheet of metal, especially in the thinner gages, may be united on its plane surface to another sheet or to any other piece of metal. For the sake of illustration, however, the process will be described as carried out in uniting two sheets or plates to one another, for which purpose the invention is particularly useful. It is to be understood, however, that I do not limit myself to the process as applied to sheet or plate metal or to uniting two plates or sheets with one another, since the invention is also applicable to forming a welded union with a plane surface or contact surface of considerable area in a piece of metal of any form.

"It is not practicable by the present process of electric welding to weld together two plates or sheets of metal on their plane surfaces, on ac-

count of the large area of surface contact between them, when laid one upon the other, which allows the welding current to pass without bringing them up to a welding heat.

"My present invention consists essentially in providing over the surface to be welded a number of contact spots or points through which the welding current is passed in multiple and applying pressure in the proper way to form a number of distinct electric welds or spots of union over said surface.

"These contact spots act to localize the current and the heating to a welding temperature and may be provided either by casting, punching or indenting the metal of the plane surface with which the welded union is to be made, or otherwise forming the same so as to provide thereon a multiplicity of isolated projections, or said contact spots may be provided by disposing a number of small pieces of metal over said surface, which pieces become united with said surface and with the opposite piece or pieces of metal in the welding process."

In the drawings which accompanied and formed part of this Rietzel application there were shown several applications of the idea of welding in spots (Rec., p. 1827).

According to Fig. 1 a plate provided with a number of separated struck-up projections was to be united to a plane plate.

Fig. 2 showed two plates with struck-up projections that were adapted to be united at the projections.

Fig. 3 showed a plate with projections cast or formed wholly on its inner face in co-operation with a plane faced opposed plate.

Fig. 4 showed two co-operating plates provided with projections like those of the plate with projections in Fig. 3.

Fig. 5 showed two plane plates with interposed separate pieces of metal through which the welding was intended to take place.

In the application, as filed, there was no specific mention of the welding together of two perfectly flat plane plates in spots, *though, as we shall, later on, see, Reitzel had long before that time done work of that character at the Thomson Electric Welding Company's shops, at Lynn, Mass. When the application was filed Reitzel and his counsel evidently thought there was no novelty in such an application of resistance welding, or else that Reitzel's public use of it had barred his right to a patent.*

Perhaps the broadest claim that was presented with the application, as filed, was the eighth, which read as follows (Rec., p. 1728):

"8. The herein described method of electrically welding a piece of metal at a plane surface thereof consisting in providing such plane surface with a current localizing projection, passing a heating current through such projection and applying pressure to unite said piece with another piece by a welded union coincident with such projection."

On June 8, 1908, the Primary Examiner, having already rejected the Reitzel application and an appeal to the Board of Examiners-in-Chief having been taken from such rejection, found a new anticipating reference, namely, British patent to Harmatta, No. 22,981 of 1903. In his letter to applicant, he said (Rec., p. 1760):

"The Examiner proposes to direct the attention of the Board of Examiners-in-Chief to the British patent to Harmatta, 22,981 of 1903, Class



219, Welding (see Fig. 4 and lines 32 and 33, page 5), as additional ground for the rejection of claims 1, 3, 4 and 6. Fig. 4 of this patent shows a spot weld, which takes the place of a rivet, and it is not considered to be a patentable improvement to join two sheet metal plates by a number of such 'spot welds.' "

So far as this record shows this was the first time the British patent, or any patent, to Harmatta had been brought to the attention of Reitzel, or to the Thomson Electric Welding Company, his assignee. So straightway, to wit, on November 24, 1908 (Rec., p. 1762), the Rietzel application was amended and broadened so as to cover the Harmatta disclosure of electrically welding plane faced plates having no pre-formed projections upon them (Rec., p. 1130).\*

This amendment took the form of a complete new specification and claims, the latter being expanded in number to twenty-three. The process of Rietzel was now no longer said to consist "*essentially* in providing over the surface to be welded a number of contact spots or points through which the welding current is passed in multiple," as in the original, but was characterized thus (Rec., 1762):

"Briefly stated, the invention consists in electrically welding pieces together in a spot or spots definitely located in and involving a portion only of their meeting surfaces as hereinafter more particularly described and claimed."

And the product of the Rietzel process was characterized thus (*Ibid.*, p. 1763):

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\*See Townsend testimony, Rec., p. 622, et seq.

"A weld formed according to my invention is distinguished, however, from such prior welds by the fact that a portion only of the opposed surfaces is welded together, such portions being coincident with and limited to spots in the areas of such opposed surfaces in which spots the heating electric current is localized or confined in any desired way so that the major portion of the opposed surfaces will not be involved in the welding, although they may, after the completion of the operation, lie in contact with one another or very close together."

Of the twenty-three new claims presented the following are typical (*Ibid.*, p. 1769):

"1. The hereinbefore described improved method of fastening two pieces of metal together by electrically welding them to one another at a spot or spots only of their juxtaposed or opposite faces.

"2. The herein described method of uniting two pieces of metal at a number of distinct or separate spots separated from one another by well-defined areas of no union, consisting in applying pressure localized at the spots of desired union, passing electric current through the pieces from one to the other, and confining the flow of current to said spots until the union is effected.

"6. The method of uniting sheets of metal by pressing them together and at the same time passing a heating and welding current from one to the other at a spot on their meeting surfaces which is restricted in area throughout the operation so as to leave on the meeting surfaces a well-defined and comparatively extensive area of no union completely surrounding said spot.

"16. Composite metal work, having its component pieces welded together at one or more spots

localized on their meeting surfaces or portions so as to be separated from one another on said meeting portions by distinct areas which are unwelded.

“17. Metal plates fastened together at their meeting portions by a number of distinct or isolated welds formed at spots of such restricted area and so separated from one another that when welding electric current is passed from one to the other at said spots, the metal between the spots will not be brought to plastic or welding condition.”

It can not be doubted that this new amended description and these new amended claims were aimed specifically at, and intended to include, cover and subordinate, the disclosure of the Harmatta British patent. The attorney who did the work—Mr. H. C. Townsend, of New York—was a pastmaster at patent drafting, was thoroughly skilled in the art of electric resistance-welding and was, in fact, the one who drew the original Thomson “Art” patent. But something had to be done to get rid of the Harmatta British patent as an anticipation of Rietzel, and to establish Rietzel’s priority over Harmatta.

Rule 75 of the Patent Office provides as follows:

“75. When an original or reissue application is rejected on reference to an expired or unexpired domestic patent which substantially shows or describes but does not claim the rejected invention or on reference to a foreign patent or to a printed publication, and the applicant shall make oath to facts showing a completion of the invention in this country before the filing of the application on which the domestic patent issued, or before the date of the foreign patent, or before the date of the printed publication, and shall also make oath that he does not know and does not believe that

the invention has been in public use or on sale in this country, or patented or described in a printed publication in this or any foreign country for more than two years prior to his application, and that he has never abandoned the invention, then the patent or publication cited shall not bar the grant of a patent to the applicant, unless the date of such patent or printed publication be more than two years prior to the date on which application was filed in this country."

Now, it so happened that while the Provisional Specification of the Harmatta British patent was filed October 23, 1903 (Rec., p. 1124), the Complete Specification was not filed till July 25, 1904, not accepted till August 25, 1904, and not sealed till November 8, 1904.

The patent, therefore, really did not count, *as a patent*, under British law, till November 8, 1904, the day of sealing of the Complete Specification.

In order, therefore, to successfully "swear back of" the Harmatta patent, it was necessary that Rietzel should "make oath to facts showing a completion of the invention in this country" \* \* \* before the effective date of that patent, that is to say, before its date of sealing.

Such an affidavit or "oath to facts" was immediately prepared by Mr. Townsend and executed by Mr. Rietzel and filed, with the following statement (Rec., p. 1775):

"We submit herewith substitute specification and claims in the above-entitled case, together with an affidavit of the inventor, making oath to facts showing a completion of the invention in this country before the legal date of the foreign patent to Harmatta, cited by the Examiner as an anticipating patent."

The affidavit of Rietzel referred to was as follows (Rec., p. 1778):

"County of New York, State of New York, ss.:

"ADOLPH F. RIETZEL, being duly sworn, deposes and says that he is the applicant who filed the above entitled application for patent; that some time in June, 1904, he successfully practiced the invention in said application by uniting two halves of a sheet metal pulley in an electric welding machine at the shop of the Thomson Electric Welding Co., in Lynn, Mass.; that the piece of sheet metal herewith attached and marked 'Specimen of pulley C. F. Tischner, Jr., • • • N. P.,' is a duplicate of one of the halves of the pulley to which he at that time applied the invention; that the contact points or projections formed in the sheet metal were in the first instance made by filing the metal to leave the contact points or projections, indenting not being available at that time, but that in subsequent operations in which his invention was employed the projections were made by indenting the sheet metal, and that the invention was frequently practiced by him successfully at the shop of said company on a standard welding machine; that in conducting the operations on such machines he employed a pair of contacts fitted in the jaws of the machine and formed at their outer ends so as to fit into the cup shaped portion of the halves of the sheet metal pulley to be welded, thereby supporting the two halves with the contact projections engaged with one another; the two halves being in contact by the projections while assembled in the machine, electric current was caused to pass through the two halves by the contact projections, and pressure was then applied in the usual way practiced in electric welding by the standard machine in which the operation in question was conducted; the operations above recited as conducted by him were uniformly

successful and demonstrated clearly that the invention was complete in all particulars, and that the said invention has been since practiced on innumerable occasions in substantially the same way for uniting pieces of sheet metal such as the halves of sheet metal pulleys of the form shown in the exhibit and of other forms and of other sizes, many of much larger size than that of the exhibit; that he does not know and does not believe that the invention aforesaid has been in public use or on sale in this country, patented or described in a printed publication in this or any foreign country for more than two years prior to his application and that he has never abandoned the invention.

ADOLPH F. REITZEL.

"Subscribed and sworn to by the aforesaid Adolph F. Reitzel before me this 23d day of October, 1908.

C. G. TISCHENER, JR.,

*Notary Public.*

"(Seal)

"Notary Public, Kings County.

"Certificate filed in New York County."

Accompanying the amendment to the Rietzel specification and the affidavit of Rietzel referred to was a supporting affidavit of Prof. Elihu Thomson, as to the value of Rietzel's improvement. In this affidavit Prof. Thomson said (Rec., p. 1782):

"That he is familiar with the process of electric welding set forth in the above entitled application of A. F. Rietzel for uniting sheets of metal together by what has been known as the 'spot welding process' and which forms a practical substitute for the riveting of plates together or for other mechanical expedient for fastening them together face to face;"

Again, contrasting the Rietzel improvement with a prior invention of one Hunter, Prof. Thomson said (*Ibid.*, p. 1784):

"That in the invention of Mr. Rietzel aforesaid, the object and essential operation are entirely different from that of the Hunter process or invention, for the reason that there is no purpose in the Reitzel invention of forming a lap weld continuous over the whole opposed surfaces of the sheet metal pieces, but on the contrary the purpose is distinctly to limit the welding to a mere spot or spots, forming, in effect, a substitute union for that made heretofore, by perforating the plates at the spot or spots of union and then inserting a rivet and heading down said rivet."

Again, referring to the exhibit filed with Mr. Rietzel's affidavit, Prof. Thomson said (*Ibid.*, p. 1786):

"The accompanying exhibit marked 'Rietzel Exhibit No. 3, J. A. McManus, N. P.,' and also with my initials 'E. T.,' is a specimen of a lap welding made by forming initial projections at such distances apart that *cold metal* will be left between said projections and the union will be, therefore, by a line of separate welded points, etc."

On Dec. 14, 1908, the broad claim 1 introduced by the amendment of Nov. 30, 1908, and which read as follows (*Ibid.*, p. 1769):

"1. The hereinbefore described improved method of fastening two pieces of metal together by electrically welding them to one another at a spot or spots only of their juxtaposed or opposite faces";

was rejected on the French patents to Egel, Nos. 356,187 and 335,889.

Claim 2, also, then standing in the case, read as follows (*Rec.*, p. 1769):

"2. The herein described method of uniting two pieces of metal at a number of distinct or separate spots, separated from one another by well defined areas of no union, consisting in applying pressure localized at the spots of desired union, passing electric current through the pieces from one to the other and confining the flow of current to said spots until the union is effected."

Regarding this claim the Commissioner in his letter of rejection said (*Ibid.*, p. 1788):

"Claim 2 is objectionable because the expression, 'Confining the flow of current to said spots,' implies the use of apparatus such as a pointed electrode. The claim is, therefore, misleading as applied to the method described by applicant. A similar objection is made to the expression, 'Localizing the pressure in and confining the flow of current' in claim 4; 'localizing the heating current' in claim 7; 'Confining the welding area of such current' in claim 8, and 'Confining the area of heating' in claim 14.

"Claims 2 to 7, inclusive, are rejected on either of the French patents cited above."

These French patents were founded on a communication from Harmatta himself, Patent No. 336,187, being a substantial copy of the Harmatta application as originally filed in this country and in Great Britain. Compare drawings of Egel (Rec., p. 1143), and translation of specifications, (*Ibid.*, p. 1144), with original U. S. Harmatta application (Rec., p. 1156, *et seq.*) and Harmatta British patent, (Rec., p. 1124).

That a disclosure of these French patents did, in fact, emanate from Harmatta is shown by Harmatta's oath appended to his U. S. application, in which he so states (Rec., p. 1364), and by Harmatta's oaths to



three preliminary statements that he subsequently filed in interference cases in which his U. S. application was involved (Rec., p. 1846; *Ibid.*, p. 1914; Rec., p. 1473).

On March 13, 1909, Rietzel struck out his amended claim 1, last above quoted, and filed a substitute for it, reading as follows (Rec., p. 1796):

"1. The hereinbefore described improved method of fastening two pieces of metal together by electrically welding them to one another at spots only of their juxtaposed or opposite faces by the application of pressure and heating current localized in such spots."

At the same time, the specification was further amended by the addition of the following paragraphs, among others (*Ibid.*, p. 1795):

"Briefly stated, the invention consists in electrically welding pieces together in spots definitely located in and involving a portion only of their meeting surfaces, by the application of pressure and heating current localized in such spot or spots."

Again (*Ibid.*, p. 1796):

"A weld formed according to my invention is distinguished, however, from such prior welds by the fact that the opposed surfaces are welded together in spots only, the heating electric current being localized or confined in any desired way to such spots so that the major portion of the opposed surfaces will not be involved in the welding, although they may, after the completion of the operation, lie in contact with one another or very close together."

With this new amendment was filed another antedating affidavit from Rietzel, under Rule 75, for the purpose of justifying the claiming by him of the process when worked out by the use of a pointed electrode and of "short-circuiting" the French patents which disclosed the use of such pointed electrodes the attorney's letter of transmittal stating (*Ibid.*, p. 1800):

"We file herewith an affidavit establishing completion of the invention on applicant's part prior to the dates of the French patents cited by the examiner in his last official letter."

It is interesting to note, at this point, that the first oath filed by Rietzel, under Rule 75, for the purpose of overcoming the effect of the British patent, only undertook to carry his date of invention back to "sometime in June, 1904," and referred to the successful completion and reduction to practice at that time of that embodiment of his spot welding invention which consisted in the welding together of plates having pre-formed projections through which the welding in spots took place.

That first affidavit was, therefore, insufficient to meet the case of the later cited French patents because the work of Rietzel set out in such first affidavit was alleged to have been done in June, 1904, whereas, the first of the French patents was published on *February* 18, 1904 (Rec., p. 1136), or four months earlier; and, further, because Rietzel apparently could not truthfully say he had successfully worked out his method of welding through projections before June, 1904.

When we come, therefore, to examine the second Rietzel affidavit, we find that in it Rietzel swore that

prior to the 18th day of February, 1904 (but how long prior he did not state nor have to state), he had successfully and repeatedly welded together sheets of metal face to face, *by the use of a pointed current-carrying electrode applied to one side of the superposed plates and a flat electrode applied to the other side*; or, in other words, he swore to the successful practice by *him* of the identical application of the electric resistance process of welding together plane-faced metal plates by means of a pointed electrode disclosed in the Harmatta British and French patents, *prior* to the effective dates of those patents.

The second Rietzel affidavit, in full, is as follows (Rec., p. 1791):

“County of New York, State of New York, ss.

ADOLPH F. RIETZEL, being duly sworn, deposes and says, that he is the applicant that filed the above entitled application for patent;

That prior to the 18th day of February, 1904, he repeatedly successfully practiced the method of fastening two sheets of metal together face to face by welding them at spots in their meeting surfaces by confining the heating electric current passed from one plate to the other in such spots and localizing the welding pressure at said spots, as claimed broadly in said application;

That the work of so uniting such sheets of metal was done at the factory of the Thomson Electric Welding Company at Lynn, Massachusetts, on a welding machine of a commercial type known as type 10 A Welder;

That said machine was the same in construction as the machine known as type 5 A Welder, but of larger size, and was identical with that shown on the attached page removed from a catalogue of the Thomson Electric Welding Company, which page is identified and marked ‘Page of Catalogue, D. M. Edsall, N. P.’;

That the accompanying pieces of work marked 'Specimen No. 1, D. M. Edsall, N. P.' and 'Specimen No. 2, D. M. Edsall, N. P.,' are duplicates of work so done by him on that machine prior to the 18th day of February, 1904, but that the original specimens were not preserved;

That in doing such work he employed a pointed electrode, the same in form as the accompanying electrode marked for identification 'Welding Electrode, D. M. Edsall, N. P.,' which electrode was clamped in one of the holders of the machine and was used to apply the localized pressure and heating current to the plates which were welded together at spots in their superficial area, the opposite or backing electrode being a block of metal which was flat and of a superficial area, approximating the area of the plates which were welded together and which opposite electrode was clamped in the opposite holder of the machine;\*

That in this operation the two plates superposed upon one another were inserted between said electrode and the pressure and heating current localized as claimed were applied by forcing the pointed electrode against the outside face of the plates and pressing them between said pointed electrode and the opposite flat electrode, current being at the same time passed from one electrode to the other and pressure being applied by employing the usual devices forming a part of the machine and used in the ordinary operation of the machine for applying welding pressure to the work;

That the work was repeatedly and successfully done in this manner upon various sizes and pieces of metal plates, none of which, however, are now in existence so far as affiant has been able to discover;

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\*The specimen of work and the welding electrode filed with this affidavit have been diligently searched for at the Patent Office but cannot be found. (See Friess, Rec., p. 708.)

That the work done by him aforesaid, demonstrated the complete success of the operation and that metal plates could be successfully and firmly united together by distinct or isolated electric welds forming welded spots of union in their meeting faces and constituting in effect a successful substitute for a union of the same by a number of rivets.

ADOLPH F. RIETZEL.

Subscribed and sworn to before me this 18th day of February, 1909.

(Seal)                      DAVID M. EDSALL,  
Notary Public, N. Y. Co."

The Harmatta British and French patents having been thus disposed of as references, the attorney for the Thomson Company proceeded further to broaden the Rietzel application by inserting the following in the specification (*Ibid.*, p. 1806):

"The product in the form of sheet metal is further particularly useful for sheet metal ware since the outer or exposed surface of the metal will have the smooth and practically unaltered finish of sheet metal and said surface will not be substantially marred when the process is properly conducted, excepting for the presence of such infrequent small depressions as might remain from the previous indentation of the metal from the back when, as hereinbefore described, an indenting of the metal may be resorted to.

"The product in sheet metal also possesses the advantage that the spots of welding when located within the edges of the meeting surfaces will not show. The product is also superior to that produced by riveting of the plates in that there are no rivet heads to mar the finish of the back or outer surfaces of the metal."

Also, by adding the following product or article claims (*Ibid.*, p. 1807):

"17. Sheet metal work comprising pieces of sheet metal welded together in the material of their meeting surfaces and in spots only, each surrounded by distinct areas of unwelded union, the back surfaces of said pieces being substantially unaltered over the welded spots, substantially as and for the purpose described.

18. Composite metal work having its component pieces welded together in spots only involving the material of their opposed or meeting surfaces, said spots being each entirely surrounded by distinct areas of unwelded union and the portion of the pieces back of the welds being substantially unaltered, as and for the purpose described.

19. Metal work comprising a metal plate fastened on its surface to the opposed surface of another piece of metal by a weld at a spot only in the material of the opposed surfaces, said spot being surrounded by a distinct area of unwelded union and the back surface of said plate being practically unaltered over said spot, as and for the purpose described."

Later, on June 19, 1909, another product or article claim was added, reading as follows (*Ibid.*, p. 1814):

"20. A metal article comprising two bodies of metal having adjacent plane surfaces united at a plurality of spaced and isolated spots of integral and autogenous welded union, the metal at the spots of welded union having substantially the same qualities as at other points."

And then, on July 20, 1909, having been drawn by a master hand with reference to the early work of Rietzel in the electrode-welding of plane-faced plates, to Riet-

zel's later work in the welding of plates with projections, to the disclosures of Harmatta British and French patents, and to the practical up-to-date development of the art of so-called "spot welding,"\* the Rietzel patent with twenty claims,—sixteen to process and four to product—was issued to the Thomson Company, as the assignee of Rietzel, and the whole practical art of "spot welding" was supposed thereby to have been delivered into the hands of the Thomson Company and left there completely at the latter's mercy!

But a curious and unexpected thing then happened. On April 14, 1910, like a bolt from a clear sky, came notice from the Patent Office to the Thomson Company that the issued Rietzel patent had been put in interference with a pending United States application of Harmatta, both as to process and product claims (Rec., p. 1819) and both parties were called upon to file their preliminary statements.

These preliminary statements, in interference proceedings, are in the nature of sworn pleadings, are strictly binding upon the parties and very difficult, indeed, of amendment.

In consequence, great care is required in their preparation.

The Patent Office rule regulating the matter is Rule 110, which reads as follows:

"110. Each party to the interference will be required to file a concise preliminary statement, under oath, on or before a date to be fixed by the office, showing the following facts:

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\*Spot welding machines for the welding of plane-faced metal plates, face to face, were on the market in this country as early as 1906-8 (McBerty, Rec., p. 742; Taylor, Rec., p. 898; Rietzel, Rec., p. 638; Clark, Rec., p. 261).

(a) The date of original conception of the invention set forth in the declaration of interference.

(b) The date upon which the first drawing of the invention and the date upon which the first written description of the invention were made.

(c) The date upon which the invention was first disclosed to others.

(d) The date of the reduction to practice of the invention.

(e) A statement showing the extent of use of the invention.

(f) The applicant shall state the date and number of any application for the same invention filed within twelve months before the filing date in the United States, in any foreign country adhering to the International Convention for the Protection of Industrial Property or having similar treaty relations with the United States.

If a drawing has not been made, or if a written description of the invention has not been made, or if the invention has not been reduced to practice or disclosed to others or used to any extent, the statement must specifically disclose those facts.

When the invention was made abroad, the statement should set forth:

(a) That the applicant made the invention set forth in the declaration of interference.

(b) Whether or not the invention was ever patented; if so, when and where, giving the date and number of each patent, date of publication, and the date of sealing thereof.

(c) Whether or not the invention was ever described in a printed publication; if so, when and where, giving the title, place, and date of such publication.

(d) When the invention was introduced into this country, giving the circumstances with the dates connected therewith which are relied upon to establish the fact.



The preliminary statements should be carefully prepared, as the parties will be strictly held in their proofs to the dates set up therein.

If a party prove any date earlier than alleged in his preliminary statement such proof will be held to establish the date alleged and none other.

The statement must be sealed up before filing (to be opened only by the examiner of interferences; see Rule 111)\*, and the name of the party filing it, the title of the case, and the subject of the invention indicated on the envelope. The envelope should contain nothing but this statement."

Now, the call of the sworn preliminary statement was quite different from the call of the affidavit under Rule 75, because, whereas, the affidavit under Rule 75 only required that the applicant should swear to facts showing a completion of the invention *prior* to the date of the patents set up in anticipation, the preliminary statement required that the *actual dates* respecting the conception and development of the invention should be set forth, with particularity. The Thomson Company, guided as it was by astute counsel, knew perfectly well that Harmatta's date of invention was as early at least as the date of the application for his British patent, i. e., October 23, 1903, since that patent had been formerly cited against Rietzel's application as an anticipation thereof and as a bar thereto; and it also knew that, under the International Convention (25 Sta. at L., 1383), and Section 4887 R. S. U. S., Harmatta could claim the benefit of his foreign filing date as the effective filing date of his application in this country, the Statute providing that:

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\*A similar statement repeating these declarations was later, to-wit, on Sept. 14, 1911, filed by Rietzel to cover a number of additional issues or counts added to the interference (Rec., p. 1917).

"Sec. 4887. An application for patent for an invention or discovery or for a design filed in this country by any person who has previously regularly filed an application for a patent for the same invention, discovery or design in a foreign country which, by treaty, convention, or law, affords similar privilege to citizens of the United States, shall have the same force and effect as the same application would have if filed in this country on the date on which the application for patent for the same invention, discovery, or design was first filed in such foreign country."

And the Thomson Company further knew, and this is most important, that if it did not set up for Rietzel a date of invention earlier than October 23, 1903, a judgment on the record would straightway be entered in favor of Harmatta and against Rietzel by virtue of Patent Office Rule 114, which reads as follows:

"114. If the junior party to an interference, or if any party thereto other than the senior party fail to file a statement, or if his statement fail to overcome the *prima facie* case made by the respective dates of application, such party shall be notified by the Examiner of Interferences that judgment upon the record will be rendered against him at the expiration of thirty days, unless cause be shown why such action should not be taken. Within this period any of the motions permitted by the rules may be brought. Motions brought after judgment on the record has been entered will not be entertained unless sufficient reasons appear for the delay."

Accordingly, to enable the Thomson Company to avert an immediate judgment against it, to obtain a "look-in," so to speak, in the interference, and to en-

able it to contest, at all, the question of priority of invention as between Rietzel and Harmatta, it caused to be prepared and sworn to by Rietzel a preliminary statement in which Rietzel declared (Rec., p. 1843)—

"That he conceived the invention set forth in the declaration of interference during the latter part of October or first part of November, 1897;

That, as near as deponent can at this time fix the date, the invention was successfully reduced to practice in the latter part of July, 1898, and at the same time was first explained and disclosed to others."

With the status thus acquired by the filing of this sworn preliminary statement, the Thomson Company proceeded, very leisurely, to occupy itself, not with the taking and submission of proofs as to Rietzel's electric welding operations in 1897-1898, but with the bringing of numerous technical motions to dissolve and the prosecution of many appeals challenging the patentability of the issues to Harmatta in view of certain admissions and disclaimers he was alleged to have made in the course of amendments to his application (Rec., pp. 1852, 1853), and challenging also the right of Harmatta to contest the interference because of the insufficiency of his oath to inventorship of the subject-matter of the issues (*Ibid.*, p. 1853), etc., etc.; the times for taking testimony in behalf of Rietzel being meanwhile extended, from time to time, under one pretext or another, so as to preserve that right.

On the 2nd day of February, 1912, nearly two years after the institution of the interference, the Thomson Company, through one of its counsel, Mr. Tiedman (a partner of Mr. Townsend), went ahead and procured from Harmatta an assignment of his pending appli-

cation (Rec., p. 1949), which, of course, gave the Thomson Company control of *both sides* of the interference, though, in form, Messrs. Townsend & Decker still appeared on the record as attorneys for Rietzel, and O. E. Duffy & Son as attorneys for Harmatta.

On May 10, 1912, these attorneys for the Thomson Company entered into a solemn stipulation again extending Rietzel's time for taking testimony (*Ibid.*, p. 1940), which was favorably acted upon by the Examiner of Interferences on May 13, 1912 (*Ibid.*, p. 1941), and Rietzel given until July 11, 1912, to take his testimony.

On July 15, 1912, no testimony having been offered in behalf of Rietzel, O. E. Duffy & Son made a solemn motion for judgment in favor of Harmatta because of the default of Rietzel to take testimony, which motion was duly and formally served on Townsend & Decker, attorney for Rietzel, and on July 24, 1912, the Examiner of Interferences entered an order to the effect that unless Rietzel should on or before August 3, 1912, show cause to the contrary, judgment would be entered against him (*Ibid.*, p. 1943); and, on the day last named, no cause having, of course, been shown, judgment of priority was entered against Rietzel and in favor of Harmatta and a limit of appeal fixed, as of August 27, 1912 (*Ibid.*, p. 1945).

It is interesting to note that Rule 125 of the Patent Office provides as follows:

"125. After the interference is finally declared, it will not, except as herein otherwise provided, be determined without judgment of priority founded either upon the testimony, or upon a written concession of priority by one of the parties, signed by the inventor himself (and by the

assignee, if any), or upon a written declaration of abandonment of the invention."

The Thomson Company, being in control of the whole situation, doubtless figured that to offer testimony for Rietzel, or to file a concession of priority by him, or to file a declaration of abandonment by him might involve the relinquishment of some right. It wished to hold on to all that Rietzel had asserted to be his and at the same time secure new and further protection, for the same thing, through Harmatta.

So it simply suffered a judgment by default to go against Rietzel. It then proceeded to hold on to the Rietzel patent, with all its twenty (20) claims till *June 12, 1915*, nearly three years later, when it filed a disclaimer as to some of the claims.

Rietzel, himself, was kept in ignorance as to how the interference was being manipulated. He testified he was not advised as to the outcome of the interference, that he did not know judgment of priority had been entered in favor of Harmatta, nor, till put on the stand in this case, that a patent had been issued to Harmatta (Rec., p. 651, Q. 123, *et seq.*).

After the judgment in favor of Harmatta in the interference case became final, the Harmatta specification and claims were again rewritten and the patent was, on December 3, 1912, *just nine years, to a day*, after the application for it was filed, granted and issued to Thomson Electric Welding Company, as the assignee.

While, as we have seen, the Harmatta application was in adversary hands, and while the sworn representations made in the Rietzel preliminary statements that Rietzel was the prior inventor over Harmatta were staving off a judgment on the record against Riet-

zel and giving to the Thomson Company the potential right to contest priority with Harmatta, the Thomson Company was developing a licensing system under the Rietzel patent from which it was deriving profit by way of royalties from users of spot welding machines that electrically welded plane-faced plates; (Rec., p. 2019) was notifying and suing users of spot welding machines for welding plane-faced plates that such use was an infringement of that patent; was suing for infringement of that patent users of even what are alleged to be Harmatta spot welding machines (Rec., p. 1991; Rec., p. 227); and was, in fine, asserting the Rietzel patent to be a good, all-covering patent for all that it claimed.

The grounds upon which defendant bases its defense of equitable estoppel may, therefore, be summarized as follows:

(1) In the matter of the granting and issuing of patents the Commissioner stands as the agent and representative of the public at large.

(2) The plaintiff's predecessor in title, Thomson Electric Welding Company, when soliciting the grant of the Rietzel patent, represented to the Commissioner of Patents, through the affidavits of Rietzel filed under Rule 75, to its own advantage and to the prejudice of the public, that Rietzel had invented both the process of electrically welding plane faced metal plates as well as the process of electrically welding metal plates provided with pre-formed projections, and the products of those processes, *before* the dates of the Harmatta British and French patents; and, on the strength of such representations, and on that alone, the Commissioner granted the Rietzel patent, with claims including and covering the disclosure of Harmatta, and, so-called "spot welding," generally.

(3) When the Rietzel patent was subsequently put in interference with Harmatta's United States application plaintiff's predecessor in title, Thomson Electric Welding Company, through the two sworn preliminary statements of Rietzel filed by it on the 20th of June, 1910, and on the 14th of September, 1911, respectively, represented to the Commissioner the reduction to practice by Rietzel of the inventions of the processes and products involved in the interference as early as 1898 and the further assertion of the priority of Rietzel over Harmatta in respect of said processes and products, thereby, to its own gain and advantage and to the prejudice of the public, averting an immediate judgment of priority against the Rietzel patent,\* giving the Thomson Company a "look-in" in the interference, and enabling it, through Rietzel, to contest priority with Harmatta, and also enabling it to employ the already granted Rietzel patent for a period of nearly three years and a half before the issue of the Harmatta patent (and for three years afterward and till a disclaimer was filed) as a title upon which to found a licensing system and under which to threaten and to sue users of electric spot welding machines, including even users of so-called Harmatta machines, for the welding of plane-faced plates.

(4) The truth or falsity of the representations made by the plaintiff's predecessor to the Commissioner has nothing to do with the efficacy of the estoppel urged. It is the *fact* of the representations, not their truth, and the *fact* that the Commissioner acted upon the representations to the prejudice of the pub-

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\*It is enough if a party has been induced to *refrain* from using such means, or taking such action, as lay in his power by which he might have retrieved his position and save himself from loss. *Pomeroy's Eq. Jur.*, Vol. II, p. 1444.

lic, first, by the granting and issuing of the Rietzel patent and thereby imposing upon the public a patent that would, otherwise, not have been granted; and secondly, by the withholding of judgment against Rietzel in the interference for a period of nearly three and a half years—which judgment would otherwise have been rendered at once—that present the essential elements of an equitable estoppel.

It is immaterial whether Rietzel did or did not, in 1898, before Harmatta entered the field, “successfully reduce to practice” the process of electric welding or the product of such process covered by the issues in the Rietzel-Harmatta interference (Rec., p. 1838; *Ibid.*, p. 1907) and by the claims of the Harmatta patent here in suit. The Thomson Electric Welding Company so represented the fact to be to the Commissioner of Patents in the affidavits under Rule 75, and in the two Rietzel sworn preliminary statements, and, now, when the plaintiff asserts the Harmatta patent against the defendant, and the defendant confronts it with the former solemn sworn representations of its predecessor in title declaring Rietzel’s prior inventorship, it is manifestly unjust and inequitable that it be heard in this Court of Equity to deny that Rietzel was prior.

It is blowing hot and cold, with a vengeance, to assert at one time, when it serves its purpose, that Rietzel is the prior inventor over Harmatta, and to assert, at a later period, when its interest is different, that Harmatta is prior.

(5) The plaintiff having, by assignment, derived its title to both the Rietzel patent and the Harmatta patent from the Thomson Electric Welding Company (Rec., p. 1968), is, through its privity with that com-



pany, bound and estopped by the acts and representations of the latter.

(6) The defendant, as member of the general public, is entitled to urge the estoppel growing out of the acts and representations aforesaid made by plaintiff's predecessor in title to the Commissioner and upon which the Commissioner, as the representative of the general public, acted, as aforesaid, to the prejudice of the public and of the defendant as a member thereof; and especially is this so as against any demand of the plaintiff asserted under the Harmatta patent, since defendant began and was established in the practice of spot welding of plane-faced metal plates in 1911 and 1912 before the Harmatta patent issued (Smith, Rec., p. 1004; Wibel, *Ibid.*, p. 1002; Prosser, *Ibid.*, p. 997; Findlater, *Ibid.*, p. 995; Evely, *Ibid.*, p. 992; Mills, *Ibid.*, p. 990; Wright, *Ibid.*, p. 987; Neeland, *Ibid.*, p. 985).

### The Law of Equitable Estoppel

In Pomeroy's Equity Jurisprudence we find the following careful statement of the essential elements constituting estoppel (Vol. II, p. 1423, par. 805):

"1. There must be conduct—acts, language, or silence—amounting to a representation or a concealment of material facts. 2. These facts must be known to the party estopped at the time of his said conduct, or *at least the circumstances must be such that knowledge of them is necessarily imputed to him.* 3. The truth concerning these facts must be unknown to the other party claiming the benefit of the estoppel, at the time when such conduct was done, *and at the time when it was acted upon by him.* 4. The conduct must be done with the intention, or at least with the *expectation* that it will be acted upon by the other

party or under such circumstances that it is both natural and probable that it will be so acted upon. There are several familiar species in which it is simply impossible to ascribe any *intention* or even *expectation* to the party estopped that his conduct will be acted upon by the one who afterwards claims the benefit of the estoppel. 5. The conduct must be relied upon by the other party, and, thus relying, he must be led to act upon it. 6. He must in fact act upon it in such a manner as to change his position for the worse; in other words, he must so act that he would suffer a loss if he were compelled to surrender or forego or alter what he has done by reason of the first party being permitted to repudiate his conduct and to assert rights inconsistent with it. It will be seen that *fraud* is not given as an essential requisite in the foregoing statement. It is not absolutely necessary that the conduct mentioned in the first subdivision should be done with a fraudulent purpose or intent, or with an actual and fraudulent intention of deceiving the other party; nor is this meaning implied by any of the language which I have used. The adoption of such an element as always essential would at once strike out some of the most familiar and best established instances of equitable estoppel. Undoubtedly, a fraudulent design to mislead is often present as an ingredient of the conduct working an estoppel, but this only renders the result more clearly just, and, if I may use the expression, more conclusive."

Again (*Ibid.*, p. 1445):

"With respect to the persons who are bound by or who may claim the benefit of the estoppel, it operates between the immediate parties and their privies whether by blood, by estate, or by contract."

Herman on Estoppel, Vol. I, p. 5, says :

“Sec. 7. The following are recognized propositions with respect to an estoppel *in pais*:

1. If a man, by his words or conduct, willfully endeavors to cause another to believe in a certain state of things which the first knows to be false and if the second believes in such a state of things and acts upon his belief, he who knowingly made the false statement is estopped from averring afterwards that such a state of things did not in fact exist.

2. If a man either in express terms or by conduct, makes a representation to another of the existence of a certain state of facts which he intends to be acted upon in a certain way and it is acted upon in that way, in the belief of the existence of such a state of facts, to the damage of him who so believes and acts, the first is estopped from denying the existence of such state of facts.

3. If a man, whatever his real meaning may be, so conducts himself that a reasonable man would take his conduct to mean a certain representation of facts and that it was a true representation and that the latter was intended to act upon it in a particular way, and he with such belief does act that way to his damage, the first is estopped from denying that the facts were as represented.

4. If, in the transaction itself which is in dispute one has led another into the belief of a certain state of facts, by conduct of culpable negligence calculated to have that result, and such culpable negligence has been the proximate cause of leading, and has led, the other to act by mistake upon such belief to his prejudice, the second cannot be heard afterwards as against the first, to show that the state of facts referred to did not exist.

5. Nobody ought to be estopped from averring the truth or asserting a just demand, unless by his acts or words, or neglect, his now averring the truth or asserting the demand would work some

wrong to some other person who has been induced to do something, or to abstain from doing something by reason of what he has said or done, or omitted to say or do."

Everest & Strode on Estoppel, 2nd Edition, pp. 14, 15, furnishes another contribution to the subject, as follows:

"Estoppels *in pais*, or equitable estoppels, as they have sometimes been called, are also of an importance which is growing daily, and far from being odious, are certainly equitable in their nature, and ought to be regarded with favor in courts of equity. Thus, in the case of *The Citizens Bank of Louisiana vs. First National Bank of Orleans*, L. R. 6 H. L., 352, Lord Selborne says:

'I apprehend that nothing can be more certain than this, that the doctrine of equitable estoppel by representation is a wholly different thing from contract, or promise, or equitable assignment, or anything of that sort. The foundation of that doctrine, which is a very important one, and certainly not one likely to be departed from, is this: That if a man dealing with another for value makes statements to him as to existing facts, which being stated would affect the contract, and without reliance upon which or without the statement of which, the party would not enter into the contract, and which, being otherwise than as they were stated, would leave the situation after the contract different from what it would have been if the representations had not been made, then the person making those representations shall, so far as the powers of a court of equity extend, be treated as if the representations were true, and shall be compelled to make them good.'

To the same effect are the remarks of Lord Blackburn in his judgment in the case of *Burkenshaw vs. Nicolls*, L. R., 3 App. Cir., 1004, where the learned judge says:

'Now sometimes there is a degree of odium thrown upon the doctrine of estoppel, because the same word is used occasionally in a very technical sense, and the doctrine of estoppel *in pais* has been thought to deserve the odium of the more technical class of homologation. But the moment the doctrine is looked at in its true light, it will be found to be a most equitable one, and one without which, in fact, the law of the country could not be satisfactorily administered. When a person makes to another the representation, "I take upon myself to say such and such things do exist, and you may act upon the basis that they do exist," and the other man does really act upon that basis, it seems to me it is of the very essence of justice that, between those two parties, their rights should be regulated, not by the real state of the facts, but by that conventional state of facts which the two parties agree to make the basis of their action; and that is what I apprehend is meant by estoppel *in pais* or homologation. But whether the term be used in its more or less technical sense, I take it that one common idea runs through the whole, namely, that your rights as between yourselves, must be regulated upon the basis, that that is accurate which you induced the other side to take as the basis upon which he was to act."

The above rather full quotations from the text writers are given because they represent the impartial conclusions reached by learned authors after careful and disinterested examination of the subject.

The text, in each instance, is supported by many cases to which we deem it unnecessary to here particularly refer.

**The Commissioner of Patents is Regarded in the Patent Office and By the Courts as the Representative of the Public.**

In the administration of the patent law it has always been held that the public, against whom the monopoly is effective, are represented, in the contract between the inventor and the Patent Office, by the Commissioner, whose duty it is to determine the right to the grant. For instance, in *Ex parte Kephart* (C. D., 1903, p. 137), it was held in regard to a public-use proceeding, that:

“The protestant in public use proceedings has no authority to make a binding agreement as to what shall be considered evidence in the case. Such proceedings are not to be regarded as a contest between the protestant and the applicant, but as an investigation on *behalf of the public* by the Patent Office. U. S. *ex rel* National Phonograph Co. vs. Allen, C. D. 1902, p. 571. The parties in interest are *the applicant* on the one hand and *the public* on the other.

The protestant does not represent the public and cannot make agreements for it. This office alone represents the public and its approval is necessary to make any agreement affecting the merits of the case binding.”

Judge Baker, in *Railroad Supply Co. vs. Hart Steel Co.*, 222 Fed., 274, defined a patent in the following language:

“A patent is a contract between the Government *on behalf of the people* and the patentee. The grant of a patent might have been made conclusive evidence of its validity, except against suits by the Government for fraud or mutual mistake in the issuance.

But the fact that certain defenses are left open to the individual should not make us lose sight of the nature of the presumption that attaches to the grant. Not merely has the application been examined *on behalf of all the people* by experts who have access to all the prior patents and publications of the world," etc., etc.

See also *Fried. Krupp Aktien-Gesellschaft v. Midvale Steel Co.*, 191 Fed., 588-594, *Buffington, J.*, and *Grant v. Raymond*, 6 Peters, 217-241, *Marshall Ch. J.*

That the Commissioner constantly acts for and on behalf of "all the people" in his dealings with applicants, and that the estoppel upon an applicant arising from the disclaimers, qualifications and limitations that he imposes upon himself when he accepts a patent may be availed of by any member of the general public who is attacked under the patent, is well established.

In *New York Belting & Packing Co. vs. Sibley*, 15 Fed., p. 386, the patentee was confronted in the Patent Office with an English patent as a reference and, in order to overcome its disclosure, he amended his claim by adding certain limitations. Later, when his patent was put in suit, he was held by the Court to a construction of it that accorded with his statements and conduct when prosecuting his application, the Court saying:

"It has several times been decided by the Supreme Court that disclaimers, qualifications, and limitations imposed upon a patentee by the Patent Office, are forever binding upon him, if he chooses to accept a patent containing them. Not only are third persons likely to be misled to their injury by any subsequent enlargement by reissue or by a

broad construction of the claims thus intended to be limited, but these qualifications are conditions precedent, without which there would have been no grant at all, and, of course, the grant must be taken as it is given. \* \* \* Construing the patent as we must according to the requirements of the Office acquiesced in by the patentee, the defendant does not infringe it, because his frame has not the peculiar construction which the Examiner declared was the only ground for issuing the patent."

The binding character of representations made by a patentee to the patent-granting authority acting for and in behalf of the public, and the availability of the estoppel created by such representations to any member of the public who is afterward pursued by the owner of the patent, is strikingly illustrated by the case of *Union Manufacturing Co. vs. Lounsbury, et al.*, 2 Fish. Pat. Cas., 389; 24 Fed. Cas., 587, decided by Judge Nathaniel Shipman, a great patent judge, in September, 1862.

The material facts of that case were as follows:

On July 15, 1829, a patent was granted to one John Arnold for an "Improvement in the Machines for Forming the Web of Cloth of Wool, Hair, or Other Suitable Substance, Without Spinning or Weaving." This patent expired by limitation (patents then running for only fourteen years) on July 15, 1843.

On October 20, 1836, another patent was granted to the same John Arnold and one George G. Bishop, for a joint invention of the two last named, relating to improvements in the same class of invention. This patent also expired by limitation on October 20, 1850.

In January, 1849, after the original Arnold patent had expired but just before the expiration of the Arnold and Bishop patent, Congress was petitioned by



the course of both patents for the extension of both patents, as one. This petition was supported, from  
*James A. Smith, Secretary of Commerce, with*  
 perseverance, and finally, on March 29, 1868, an act  
 was passed extending both patents, as one, for the  
 further term of fourteen years from that date.

On March 18, 1868, the extended patent was renewed and suit was then brought upon it against the defendants, *Loomis, et al.* After a recital of the above facts the learned judge, in his opinion, said (p. 300):

"The bill is founded upon the renewed patent and it becomes a vital inquiry whether or not this patent is valid. If it is not a valid patent, then the suit fails. If it is valid, and the respondents infringe, then they are liable to be enjoined. I have no doubt on this question. The patent of 1829, both in its original form and in that of the renewal, is invalid, because it did not and does not describe a practical invention. The conception of the inventor, in all the forms in which he attempted to reduce them to practice, proved un-  
 less and abortive, until 1836, when the joint inven-  
 tion of Arnold and Bishop was made. The proof of the utter worthlessness of the invention origi-  
 nally made by Arnold, is to be found in the evi-  
 dence produced before the Court from the floor  
 of Congress, and upon which that body acted in  
 granting the renewal. This evidence was pre-  
 sented and presented to that body by those com-  
 plaintiffs, and it presents conclusive proof, to my  
 mind, that the original 'invention was incom-  
 plete.' And, after having obtained an act of Con-  
 gress extending the two patents as 'one invention,'  
 on the express ground that the first one was an  
 complete invention, within the meaning of the pat-  
 ent act, it is too late for those complainants to set  
 up the contrary fact, and seek by argument, to  
 prove that which they have solemnly disavowed

to be worthless. The report of the committee, recommending the passage of the act says: 'No inconvenience can result to the public or injury to any individual, by the renewal and extension of the first patent, because the invention was imperfect, and a working machine could not be constructed except in connection with what is covered by the second patent.' This conclusion of the committee is supported by evidence presented to them and which has been adduced on this trial. After the legislature has acted upon this conclusion and passed the statute in question for the benefit of these complainants by granting them rights adverse to the public and to individuals, it would ill comport with the duty of a court of equity to aid them in reversing the facts, and thus working the very hardship which they had satisfied Congress could never exist.

Should it be said that this conclusion of the court only applies to the machine, and leaves the original process sheltered by the reissue, there are several answers. If this process is anything more than the function of the machine, it is a purely mechanical process wrought by the machine, and by the machine alone.

If no working machine could be made according to the invention of Arnold, then no process was ever successfully invented by him, for there is no evidence that he worked the process except by the machine. The intellectual conception of a possible process without a potential working of it out, is not patentable.

If an inventor merely conceives a mechanical process in his mind, and then sets to work to construct a machine to work that process and works it out in no other way, and the machine fails to work successfully, then his claim as the inventor of a process is as groundless as his claim as the inventor of a machine.

Arnold having failed to work this alleged process, except by his machine, both claims to 'inven-

tion,' in the sense of the patent act, fall to the ground.

But if it appeared that Arnold invented a mechanical process that could be distinguished from the function of his machine, and which could furnish a distinct ground of claim for an invention, still there is, in the judgment of the court, an insuperable difficulty in the way of these complainants availing themselves of it.

They represented to Congress, in the most solemn manner, that the invention of 1829 was incomplete and worthless of itself and of no value except in connection with the subsequent invention of 1836. They must, therefore, be deemed to have repudiated any claim to an invention by Arnold of a mechanical process, and to have abandoned it, if any such claim had ever existed in Arnold or themselves. Congress having passed the act for their relief, based upon the faith of these representations, equity and good conscience demand that they should be held to them."

This last mentioned case cannot be distinguished, in principle, from the one at bar.

There, the patent granting authority, acting for and on behalf of the public, was Congress itself; here, it was the Commissioner of Patents.

There, the representations to Congress of which the estoppel was predicated was the worthlessness and inoperativeness of the process of the patent of 1829; here, the representations to the Commissioner, were, first, the successful reduction to practice of the process by Rietzel establishing Rietzel's priority over the British and French Harmatta disclosures, by virtue of which the Rietzel patent was secured; and, secondly, the successful reduction to practice of the process by Rietzel, establishing Rietzel's priority over the disclosure of the U. S. Harmatta application by virtue of

which a judgment on the record against Rietzel and his assignee was averted; a standing on the question of priority was secured to Rietzel and his assignee; and the availability of the Rietzel patent against the public continued.

There, as here, the estoppel was urged by a member of the general public sued as an infringer, against one in privity with those who had made to the public agent the representations and declarations of which the estoppel was predicted.

The case constitutes an emphatic vindication of the principle now invoked by defendant in this Court of Equity, that a patentee or one in privity with him, will not be permitted to declare and represent one state of facts to the public or its representative, upon which the public or its representative acts to the detriment of the public, and to then subsequently repudiate these declarations and representations and assert a different and contradictory state of facts, as against a member of that same public.

No one can doubt that when the representations in question were made it was the intention and expectation that the Commissioner would gain the impression and form the judgment that Rietzel was the prior inventor over Harmatta, as well with respect to the process of welding plane-faced plates, face to face, as with respect to the process of welding plates provided with projections and that Rietzel's practice of the former process carried back to the year 1898. The estoppel cannot, therefore, be limited to the last named process. Had the representations been intended to extend only to such process there would have been no point in having mentioned the process of welding plane-faced plates by means of a pointed electrode

with such particularity and as the one first to be practiced by Rietzel.

That the Commissioner so understood the matter is clear from his grant of claims to Rietzel covering fully Harmatta's disclosure. The Trial Court sustained this defense and its treatment of the matter in its written opinion leaves nothing to be desired (pp. 42-50).

**RIETZEL DID ACTUALLY ELECTRICALLY  
WELD PLANE-FACED PLATES IN SPOTS  
IN 1898.**

Although the truth in regard to Mr. Rietzel's early work is immaterial to the defense of equitable estoppel just discussed, defendant, nevertheless, had the temerity to go into plaintiff's camp, summon Mr. Rietzel and put him on the stand in support of its other affirmative defense of prior invention by Rietzel (Rec., p. 633).

Mr. Rietzel is still in the employ of the Thomson Company, as both he (Rec., p. 660; Rd-Q. 167) and the witness Clark (Rec., p. 262) had to admit. All that he had to say was evidently tinged with the bias of interest. There were, however, some very material things he was obliged to admit, namely, that he was employed by the Thomson Electric Welding Company from August, 1888, to June 21, 1907 (Rec., p. 634, Q. 5) as foreman, superintendent, engineer and manager; that in July, 1898, he welded together plane-faced overlapped plates of metal, in spots, by the use of a flat electrode on one side of the plates and a pointed electrode on the other side (*Ibid.*, p. 635); that these electrodes were used in connection with a standard Thomson butt welding machine (*Ibid.*, p. 636);

that the welds made were subjected to various severe tests and found to be good welds (*Ibid.*, p. 638); that the meeting faces of the overlapped portions of the metal were plane, smooth faces; that his work involved a method of welding two plates or sheets of metal together, face to face, between electrodes, consisting in restricting the area of contact of an electrode with said plates to a spot, passing a heating electric current from said electrode to the co-operating electrode through said spot to heat the work to the welding temperature and applying pressure to the work in line with said spot to effect the welding of one plate to another; that the product or article produced by him consisted of metal plates fastened together by a number of distinct and isolated welds on their meeting surfaces and in spots comprising meeting portions of the metal plates, the backs of said plates being practically unaltered in their metallic condition and spots on the meeting surfaces being separated from one another by distinct unwelded areas (*Ibid.*, p. 635); that his contacts or electrodes were of copper (*Ibid.*, p. 637).

Under the questioning of counsel for plaintiff, Rietzel, of course, attempted to give the impression that his work in 1898 was fugitive, experimental and amounted to nothing. Having several times referred to his work as experimental, he was asked the following question on redirect examination (*Ibid.*, p. 659):

“Rd-Q. 164. How do you reconcile your answers to X-Qs. 160 and 161 with the statements in your affidavit filed in your application for patent and executed on the 15th day of February, 1909, in which you say, ‘That prior to the 18th day of February, 1904, he repeatedly, successfully practiced the methods of fastening two sheets of metal together face to face by welding them at spots

in their meeting surfaces by confining the heating electric current passed from one plate to the other in such spots and localizing the welding pressure at such spots \* \* \* that work was repeatedly and successfully done in this manner upon various sizes and pieces of metal plates \* \* \*.

That the work done by him as aforesaid, demonstrated the complete success of the operation and that metal plates could be successfully and firmly united together by distinct or isolated electric welds forming welded spots of union in their meeting faces and constituting in effect a successful substitute for a union of the same by a number of rivets.'

A. I can answer that by saying that I did weld various pieces of sheet metal together by using the pointed electrode as one and a flat electrode as the other, but only so far as I can remember now at the times mentioned, that is in July, 1898, and again in September or October, 1898, I considered some of the welds that I made satisfactory and successful, but did not consider it a commercial or practical experiment at that time."

The Court will, of course, have to decide which piece of evidence has the greater probative force, the testimony of Mr. Rietzel given, as a hostile witness, in a strenuous litigation, in 1919, or the affidavit of Mr. Rietzel given *ante litem motam*, in February, 1909, ten years earlier.

Of the two persons to whom Mr. Rietzel admits having explained his invention, one, Mr. Charles Osgood, is dead (Rec., p. 254, Q. 26) and the other, Mr. Clark, is still an employee of the Thomson Company and remembers nothing!

Mr. Rietzel, when on the stand, made a sketch illustrative of the work done by him in 1898 (Rec., p. 640). It is identified as "Defendant's Exhibit Rietzel

Sketch'' and is reproduced in the record, p. 2041. Counsel for plaintiff endeavored to establish by the witness that welds applied in accordance with the showing of this sketch would, because the pointed electrode was placed initially close to the edge of the work, "squash out" the metal at the edge. Here, again, the evidence of the affidavit of 1909, drawn by counsel for the Thomson Company ten years earlier, must be considered. It says (Rec., p. 646):

"That the work done by him, as aforesaid, demonstrated the complete success of the operation and that metal plates could be successfully and firmly united together by distinct or isolated electric welds forming welded spots of union in their meeting faces and constituting in effect a successful substitute for a union of the same by a number of rivets."

This affidavit was filed to support such claims of Rietzel as the following, for instance (Rec., p. 1770):

"6. The method of uniting sheets of metal by pressing them together and at the same time passing a heating and welding current from one to the other at a spot on their meeting surfaces, which is restricted in area throughout the operation so as to leave on the meeting surfaces a well defined and comparatively extensive area of no union completely surrounding said spot."

And this (Rec., p. 1799):

"24. Sheet metal plates electrically welded together by heating current and pressure at a spot or spots definitely located in and involving the heated material of the opposed or meeting portions of the plates entirely surrounded by distinct areas unwelded, as and for the purpose described."



Furthermore, Mr. McBerty, while on the stand, before his Honor Judge Killits, produced samples of welding showing that welding may be done with the pointed electrode close to the edge of the work, without producing any "squashing out" of the metal (Rec., p. 764, Q. 296). (Defendant's Exhibit Y.)

Mr. Rietzel gave a reason why the spot welding of plane-faced plates was not mentioned in his application filed in February, 1905, as follows (Rec., p. 641):

"Q. 57. I notice that this application was filed in February, 1905, and illustrates in its drawings more particularly the formation of spot welds by the use of projections between the proximate faces of the sheets. Do you know of any reason why you did not mention in the application for this patent the spot welding of sheets without projections between the proximate faces?

A. Well, I might explain that by saying that at that time, that is, the period between 1896 and 1904 it was not the policy of the Thomson Electric Welding Company to apply for patents of any kind until such time as they had, or would expect in the immediate future, to receive an order for an electric welding plant for any particular or special purpose before applying for patents and as during the period between the fall of 1897 and the year 1904 we did not receive or have any problems put up to us by which use might be put to some of those experiments which I did in 1898 as regards the welding in spots, but in 1904 we had occasion to apply on a particular class of work the method of raising projections on the work to be operated on. As this proved highly successful at the very start it was decided to make application for patents on this subject-matter."

If the whole truth were told about this matter it would doubtless appear that the reason that the weld-

ing of plates having projections was disclosed and the welding of plane-faced plates was not disclosed was the belief, at that time, that there was no patentable invention in the welding together of plane-faced plates and, therefore, no point in mentioning that such a thing had been or could be done.

Not only did the Rietzel application, as originally filed, make no disclosure of the welding together of such plane-faced plates, face to face, but it contained no claim broad enough to include and cover such a process (Rec., p. 1727).

Examination will show that original claims 1, 2 and 3 were each limited to a process that involved the *simultaneous* making of a *multiplicity* of distinct welds at a *multiplicity* of contact points, and that claims 4, 5, 6, 7 and 8, constituting the remainder of the original claims, were each limited to a method of welding involving the formation of distinct projections on the plates, by indenting, or otherwise.

It was not till the citation by the Patent Office of the British patent of Harmatta, on the 8th day of June, 1908, *nearly three years after the application of Rietzel was filed*, that Rietzel began to file claims that were inclusive of Harmatta's disclosure of the welding of plane-faced plates, face to face, and that covered Rietzel's similar early work. The following is typical of the first effort to put forward such an inclusive claim, to-wit, on Nov. 30, 1908 (Rec., p. 1770):

“6. The method of uniting sheets of metal by pressing them together and at the same time passing a heating and welding current from one to the other at a spot on their meeting surfaces which is restricted in area throughout the operation so as to leave on the meeting surfaces a well defined and comparatively extensive area of no union completely surrounding said spot.”

It was to support these broad inclusive claims that Rietzel's early work of 1898 in the spot welding of plane-faced plates, face to face, was harked back to to accomplish the "short circuiting" of Harmatta, whose date of invention was known then, to be at least as early as 1904, the effective date of his British patent, and was presumed to be earlier still, if by any chance, he had pending a United States application—which, it subsequently turned out, he had!

Before leaving this affirmative defense of prior invention by Rietzel, we would remark, that if the affidavits of Rietzel put forward by the Thomson Company did not really tell the truth, but were false and misleading, and intended so to be, then there is, indeed, greater reason for sustaining the defense of equitable estoppel. If a statement of facts believed and offered *in good faith*, may, nevertheless, operate as an estoppel, by how much greater reason should a statement of facts *known to be false*, have that effect.

#### **WHAT HARMATTA THOUGHT HE HAD INVENTED AND WHAT HE SOUGHT TO PATENT**

No doubt Mr. Harmatta would be very much surprised to learn what plaintiff now contends was the invention for which he originally solicited a patent.

By a process of elimination and suppression, on the one hand, and of expansion, on the other, the things claimed by him as of his invention in his original application have been entirely displaced by claims for processes and products which he not only never claimed to have invented, and never swore to, but never claimed nor suggested as inventions at all!

In the record will be found a certified copy of the application as originally filed by him and of all amend-

ments made to it (Rec., p. 1354), and also a detached, line for line, copy of the original application (Rec., p. 1156) and a copy of the original drawing (*Ibid.*, p. 1166) printed separately.

Apparently, the only prior electric welding art known to Harmatta at the date of his original specification was (1) the process of electric arc-welding exhibited, for instance, in the United States Benardos and Olzewski patent No. 363,320 (Rec., p. 1030) of 1887, wherein no pressure at all was exerted on the work by the current-carrying electrodes, and (2) the process of electric resistance-welding disclosed in the original Thomson "Art" patent No. 347,140 of 1886 (Rec., p. 1021), wherein pressure was applied directly to the whole surface of the pieces or parts to be united through the medium of electrode clamping jaws, for the original Harmatta specification states (p. 2, Rec., p. 1357) :

"According to none of the present known electric welding processes are the articles to be welded firmly pressed together during the welding operation by one or both electrodes, for the purpose of favoring welding. Hitherto either no pressure has been exerted at all, or it has been exercised at a certain distance from the place of welding, or at all events not centrally direct upon the electrodes pressing on the place to be heated. In short, hitherto direct electric welding pressure has never been exercised by means of the electrodes located in the direction of the current directly above the surface or point being welded."

The specification then goes on to point out that various means may be employed for exerting the necessary pressure required by the alleged new process (p. 2) :

"For carrying out the new process various apparatus may be employed, as the necessary pressure may be exerted at the place of welding by the aid of any of those technical means which are suitable for producing or transmitting pressure; *e. g.*, with a press either direct or by means of indirect transmission by levers. Or it may be by means of simple hand levers, that is to say, by means of direct or indirect manual power."

And then comes a description of the various forms of electrodes that may be employed for applying the pressure. Figs. 1 and 5 are referred to as illustrating the use of one form of electrode that will serve; and Figs. 2 and 3 another form of electrode; Fig. 4, another form; and Fig. 6, still other forms.

Referring to the forms of electrodes shown in Figs. 1 and 5, the specification states (p. 2):

"Fig. 1 is a view illustrating the welding of two metal sheets of equal thickness, intermittently or at certain spots only.

Fig. 5 is a side elevation of a welding device (also illustrated in part in Fig. 1) according to which the pressure is exercised by pin-shaped electrodes, the form of which may be suited to the particular purpose in view, and which may be adapted to work on the smallest possible surface of contact."

And referring to the form of electrode shown in Figs. 2 and 3, the specification says:

"Fig. 2 is a front elevation and

Fig. 3 a side elevation of a device which may be employed for continuous welding, the pressure being exerted by roller electrodes, whereby the advancing series of single points of the seam to

be welded is united to a whole with a minimum consumption of current."

It is perfectly apparent that Harnutta regarded both these forms of electrodes as operating upon precisely the same principle, as indeed they do. The pin form of Figs. 1 and 2, of course, applied pressure to the work at but a single point at a time with a minimum consumption of current, and to make plain that the roller electrodes operated similarly, the specification industriously stated, as we have already seen, that where the pressure is applied through such roller electrodes,

"the advancing series of single points of the seam to be welded is united to a whole with a minimum consumption of current."

There was, apparently, a studied attempt on Harnutta's part to show, as closely as possible, that the welding of the plates at a series of points so close together as to cause a merging of the welding was not essentially different from the welding of the plates at separated, isolated points.

In either case, there was, as expressed in the quoted part of the specification, "a minimum consumption of current."

To have welded the whole length of the seam at once, by flat electrodes that extended from end to end, would have obviously required a very large amount of current, but by using rollers that operated upon the plates at one point only at a time, practically the same economy of current was effected as when pointed electrodes applying current at but one point at a time, were employed.

Not was any distinction, in principle, in the operation of the different forms of electrode, made in the original claims.

The first two claims were relatively broad and inclusive. They read as follows (Rec., p. 1181):—

"1. The process of electric welding, consisting in employing the electrode not only to conduct the current to the objects being welded, but also to exert a suitable pressure on the same, substantially as described.

2. An electrode apparatus for electric welding, comprising two electrodes between which the objects to be welded are introduced, and means whereby one of the electrodes can be approached to and retracted from the other, substantially as described."

Both of these claims apply equally to the gas electrode of Figs. 1 and 3 and to the roller electrode of Figs. 2 and 3, and were obviously intended to do so.

The two remaining claims were specific to the roller electrode apparatus *per se*, and read as follows:

"3. An electrode apparatus for electric welding comprising two roller electrodes between which the objects to be welded are introduced, and means for pressing the electrode to the work, substantially as described.

"4. An electrode apparatus for electric welding comprising two roller electrodes between which the objects to be welded are introduced, means for pressing the electrode to the work, and means for rotating one or both of the rollers for the purpose of advancing the work in its path between the electrodes, substantially as described."

On January 3, 1904, all these claims were rejected. On May 18, 1904, attorneys for Harmanis replied

to this rejection by striking out the original specification and claims and filing a new amended specification and a single claim (*Ibid.*, p. 1367) and by striking out the original drawing and substituting a new drawing (*Ibid.*, p. 1373).

*This amendment eliminated all showing of the roller electrode apparatus from the application and it was never thereafter reintroduced, which accounts for its absence in the Harmatta patent, as finally issued.*

The new claim introduced in connection with the substitute specification last referred to read as follows (*Ibid.*, p. 1373):

“The process of electrically welding thin sheets and the like, consisting in applying pressure at the place of welding of the two superposed metallic objects to be united, for the purpose of effecting thorough superficial contact between them, and then, whilst maintaining the said pressure, heating the objects by passing an electric current through them, substantially as described.’

On August 10, 1904, this claim was rejected on patent to Blevins, No. 758,503, of April, 1904. (*Ibid.*, p. 1374.)

On Nov. 26, 1904, the former claim proposed was stricken out and the following new claim filed, limiting the invention to the welding of sheets of two millimeters (about 2-25ths of an inch) or less in thickness (*Ibid.*, p. 1375.)

“The process of electrically welding thin metallic sheets and the like, from about two millimeters in thickness downward, consisting in first pressing intimately together the two superposed metallic objects at the very point in which the



welding joint is to be formed, and then, whilst maintaining the intimate pressure, heating the objects by passing an electric current through them exactly at said point, in which the welding is to be effected, substantially as set forth."

This claim was, on March 30, 1905 (Rec., p. 1380) rejected on the so-called roller welding patent to Thomson, No. 444,928, of 1891 (*Ibid.*, p. 1047) and the so-called soldering patent to Thomson, 496,016 (*Ibid.*, p. 1053.)

On Nov. 17, 1905, another amendment was filed canceling the last quoted claim and substituting two new ones therefor, each also limited to the welding of plates of two millimeters or less in thickness (*Ibid.*, p. 1384).

These claims were, on Dec. 1, 1905, also rejected on the aforesaid Thomson patents, the Examiner stating (*Ibid.*, p. 1388):

"As described in patent 444,928, the plates to be welded are pressed together by means of the screw S, thus forming an electrical contact between them, the electric current is then turned on for the purpose of heating the plates and forming a weld between them—see the description in lines 84 to 94, page 1 of said patent."

On May 18, 1906, the claim last before presented was canceled and another substituted (by newly appointed attorneys, Messrs. O. E. Duffy & Son), reading as follows (*Ibid.*, p. 1395):

"1. The process of electrically welding thin metallic sheets and the like consisting in applying suitable electrodes on the metallic objects at the very point at which the welding joint is to be

formed, then causing said electrodes to exert a pressure on the metallic objects sufficiently to press the metallic objects intimately together at the point at which the welding joint is to be formed, then heating the metallic objects by passing an electric current through said electrodes and through the metallic objects, maintaining the pressure of said electrodes on the metallic objects during the passage of the electric current through the electrodes and metallic objects."

This claim also was, on June 7, 1906, rejected on the Thomson patents Nos. 496,019 and 444,928 of record (*Ibid.*, p. 1396).

On Dec. 3, 1906, the specification and claim were canceled and a new specification and claim filed (*Ibid.*, p. 1399).

The new claim read as follows (*Ibid.*, p. 1403):

"The process of electrically welding thin metallic sheets, consisting in applying suitable electrodes on the metallic sheets at the very point at which the welding joint is to be formed, then causing said electrodes to exert a pressure on the metallic sheets sufficiently to press the metallic sheets intimately together at the point at which the welding joint is to be formed, then heating the metallic sheets by passing an electric current through said electrodes and through the metallic sheets, and maintaining the pressure of said electrodes on the metallic sheets during the passage of the electric current through the electrodes and metallic sheets."

This claim was also rejected on the Thomson patents 496,019 and 444,928, of record, and also on the Blevins patent No. 758,503 (*Ibid.*, p. 1404).

On Dec. 4, 1907, or nearly a year after the last rejection, another amendment was filed striking out the

former claim and presenting two new ones, reading as follows (*Ibid.*, p. 1405):

"1. The process of electrically welding a plurality of metal sheets, consisting in exerting a heavy mechanical pressure by means of electrodes on said sheets, thereby flattening, smoothing out and eliminating all irregularities and intimately pressing said sheets together, whereby air space and interstices between said sheets are eliminated subsequently passing an electric current through the sheets thus softening and welding same while maintaining the heavy pressure of the electrodes on the sheets.

2. The process of electrically welding thin metallic sheets, consisting in applying suitable electrodes on the metallic sheets at the very point at which the welding joint is to be formed, then causing said electrodes to exert a maximum pressure on the metallic sheets sufficiently to press the metallic sheets intimately together at the point at which the welding joint is to be formed, then heating the metallic sheets by passing an electric current through said electrodes and through the metallic sheets, and maintaining the maximum pressure of said electrodes on the metallic sheets during the passage of the electric current through the electrodes and metallic sheets."

These claims were, on January 6, 1908, also rejected on the Thomson patents of record (*Ibid.*, p. 1408).

On the 6th day of January, 1909, being the last day of the year allowed by statute within which to take action to avoid abandonment (4894 R. S., U. S.) a formal amendment to claim 1 last presented was made and a reconsideration of both claims requested (*Ibid.*, p. 1409). Both claims were, however, on February 9, 1909, rejected on the Thomson patents 444,928 and 496,016, and the Blevins patent 758,503 already cited in the case.

In his letter of February 9, 1909, last above referred to, the Examiner (who had already allowed the Rietzel application with claims covering Harmatta's disclosure apparently, began to think he was not giving Harmatta a square deal) stated (*Ibid.*, p. 1411):

"It is thought that if there is any patentable matter in this case it resides in the securing of the sheet metal parts together by means of the small round, sharply-defined place of welding which answers the purpose of a rivet, as is set forth on page 6 of the original specification."

On January 28, 1910, nearly a year later, another substitute specification, claims and drawing were filed, the claims reading as follows (*Ibid.*, p. 1416):

"1. The process of electrically welding thin metallic sheets, consisting in securing the sheet metal parts together by means of a small round, defined place of welding which answers the purpose of a rivet.

"2. The process of electrically welding thin metallic sheets, which consists in introducing the sheet metal parts to be welded between electrodes having the form of pins, pressing said electrodes firmly together and closing the circuit, whereby the specified small round, very sharply defined place of welding which answers the purpose of a rivet is obtained, substantially as set forth."

Between the date of the Examiner's aforesaid suggestion of the possible existence of patentable subject-matter in Harmatta's case, to-wit, February 9, 1909, and the date of the response of Harmatta's attorney thereto, to wit, January 28, 1910, the application for the Rietzel patent was allowed, and the Rietzel patent, on the 20th day of July, 1909, actually issued, with its

broad claims covering the Harmatta disclosure, completely. Then, in acting upon the Harmatta amendment of January 28, 1910, the Examiner, rather naively stated, in a communication dated March 22, 1910 (*Ibid.*, p. 1418):

“Claims 1, 5, 6, 16, 17, 18, 19 and 20 of the patent to Rietzel, 928,701, July 20, 1901 (219-10) are suggested to applicant in accordance with the provisions of Rule 96 for the purposes of interference. He is required to make these claims on or before May 3, 1910, otherwise he will be considered to have disclaimed the subject-matter thereof in accordance with Rule 96 and the claims now in the case will be rejected as covering nothing patentable over such disclaimer.”

Patent Office Rule 96 referred to reads as follows:

“96. Whenever the claims of two or more applications differ in phraseology, but cover substantially the same patentable subject-matter, the Examiner, when one of the applications is ready for allowance, will suggest to the parties such claims as are necessary to cover the common invention in substantially the same language. *The Examiner will send copies of the letter suggesting claims to the applicant and to the assignees, as well as to the attorney of record in each case.* The parties to whom the claims are suggested will be required to make such claims and put the applications in condition for allowance within a specified time in order that an interference may be declared. Upon the failure of any applicant to make the claim suggested within the time specified, such failure or refusal shall be taken without further action as a disclaimer of the invention covered by the claim, and the issue of the patent to the applicant whose application is in condition for allowance will not be delayed unless the time

for making the claim and putting the application in condition for allowance be extended upon a proper showing. If a party make the claim without putting his application in condition for allowance, the declaration of the interference will not be delayed, but after judgment of priority the application of such party will be held for revision and restriction, subject to interference with other applications."

It would seem to have been fairer for the Examiner to have suggested these Rietzel claims to Harmatta before the Rietzel patent had been permitted to go to issue. It certainly was within his power to have done so under the provisions of this Rule 96. But, for reasons that will probably never be known, he did not do it; and when, on March 31, 1910, Harmatta's attorney presented an amendment incorporating, not only the suggested claims 1, 5, 6, 16, 17, 18, and 19, but five additional claims, as well, of the Rietzel patent (which number was ultimately increased by the addition of three claims more) (*Ibid.*, p. 1427), the Examiner did finally declare the interference it carried eight (8) counts (*Ibid.*, p. 1425), to which, by a second declaration, made later, were added three (3) counts more (*Ibid.*, p. 1430).\*

The thing, however, that stands out prominently in the whole transaction is the fact that nothing patent-

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\*These claims were put in without a supplemental oath and have consequently never been sworn to by Harmatta. They were introduced more than five years after the imported foreign machines had been put into public use by The National Enamelling & Stamping Company and over two years after spot welding machines made by the Winfield Company and others had been put upon the market.

In the case of *ex parte* Lillie, 53 O. G., 2041, Commissioner of Patents Mitchell (than whom a sounder patent lawyer never lived) in criticising an attempt to enlarge a case by amendment after a long lapse of time, without the support of a supplemental oath, said:

ably new was discovered in Harmatta's case until it had been unsuccessfully prosecuted for between six and seven years and until after the Thomson Company's lawyers had, in the Rietzel case, convinced the Patent Office officials of the patentability of the disclosure of Rietzel and that Rietzel's invention antedated the effective dates of the Harmatta foreign patents.

After the decision of priority in favor of Harmatta, in the interference between the Rietzel patent and the Harmatta application—brought about, as we have seen, by the default of the Thomson Company and its failure to take testimony in behalf of Rietzel—the Harmatta application was again revised—not by O. E. Duffy & Sons, as would appear on the face of the record, but by H. C. Townsend, Esquire, the lawyer who wrote the original Thomson "Art" patent of 1886, and also the Rietzel patent, and who, notwithstanding, is afraid to state what "spot welding" is (Rec., p. 628)—and in it were incorporated many of the method or process claims and all of the article or product claims of the Rietzel patent; with the net result that when the Harmatta patent issued to the Thomson Co. on December 3, 1912, as a patent for seventeen years from that date, the Thomson Company had already, through its possession of the Rietzel patent (obtained by its representations of Rietzel's

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"Another reason for the requirement of seasonable amendment is that courts look with disfavor upon attempts to enlarge the scope of an application once filed (*Railway Co. vs. Sayles*, 97 U. S., 554); and delay in filing amendments which enlarge the scope of the application as first filed, especially if they would operate to the prejudice of intermediate inventors, raises a presumption that the original application correctly set forth the scope of the invention then made, and that the additions or variations disclosed by the amendments are of late discovery. (*Robinson on Patents*, Sec. 561; see also *Consolidated Electric Light Co. vs. McKeesport Light Co.*, 49 O. G. 1536 40 Fed., 21)."

priority over Harmatta) enjoyed the monopoly of the same subject-matter for over three years and a half, giving that Company an aggregate monopoly of twenty and one-half years, which, we respectfully submit, hardly squares with a Court of Equity's notion of fair play to the public.

### THE HARMATTA PATENT

We have hereinbefore undertaken to analyze and discuss the disclosure of the Harmatta application as originally filed, drawing specific attention to the fact that all that Harmatta *therein* claimed and swore to as his invention, and, we may now add, all that he ever claimed and swore to *anywhere* as his invention, was, broadly (1) the process consisting in employing electrodes not only to conduct the current to the objects being welded, but also to exert a regulable pressure on the same, as carried out either by pointed electrodes, or roller electrodes, and (2) an apparatus for electric welding involving, specifically, the use of roller electrodes, both of which subjects-matter were clearly and indubitably anticipated, for instance, by the Thomson roller electrode patent No. 444,928, of January 20, 1891, upon which the application was repeatedly rejected.

We come now, to consider the patent itself, granted after the application had been kept pending for ten years, after the practical art had been fully developed by others, after the Rietzel patent had been granted, and after judgment against Rietzel, by default, had been secured by the deft manipulations of the Thomson Company.

Bearing in mind what the original application as filed showed and described, the first thing that strikes



us in examining the patent is the entire absence of any allusion to the use of roller electrodes. From both description and drawings the roller electrode apparatus, which figured so conspicuously in the original, has been entirely eliminated.

This was really done, of course, most foxily, for the purpose of avoiding comparison with the Thomson roller welding process; but is now attempted to be explained on the theory that while resistance-welding with one or more pointed electrodes is practicable, resistance-welding by means of one or more roller electrodes is entirely impracticable, thereby rendering the former patentable and the latter unpatentable!

The difficulty about this explanation is, however, that it is at war with the facts of record, that is to say:

(1) The Thomson patent No. 444,928 of January 20, 1891, taken and owned by the Thomson Electric Welding Co., shows and describes the use of such roller electrodes as practicable.

(2) The Lemp patent, No. 553,923, of February 4, 1896, also taken by the Thomson Electric Welding Company, shows and describes the use of such roller electrodes as practicable.

(3) The Harmatta British patent (Rec., p. 1124), the Harmatta (Egel) French patent (*Ibid.*, p. 1140), and the Harmatta Canadian application (Rec., p. 2043), all set forth the use of roller electrodes as practicable.

(4) Mr. Gravell, plaintiff's expert, admits that roller electrodes are practicable (Rec., p. 103, X-Q. 191, p. 104; X-Q. 199, *et seq.*).

(5) Mr. Geo. W. Knapp, plaintiff's witness, testifies that he successfully used roller electrodes (Rec. p. 221, X-Q. 27, *et seq.*).

(6) Mr. Geo. W. Knapp, Jr., plaintiff's witness, testifies to the same effect (Rec., p. 233, X-Q. 20, *et seq.*).

(7) Mr. Robert W. Clark, another of plaintiff's witnesses, testifies to the same effect (Rec., p. 263, X-Q. 114, *et seq.*).

(8) Prof. Thomson himself testifies to the practicability of welding by roller electrodes as carried out by his patent, 444,928, and states the same to be in extensive use (Rec., p. 533, Q. 28).

(9) And Mr. Dyer, defendant's expert, testifies to the entire practicability of roller electrodes and to the repeated successful use of the same by him (Rec., p. 583, p. 597, *et seq.*).

The next thing that attracts our attention is the new matter which the specification of the patent discloses.

On page 1, line 12 of the specification, we find a statement to the effect that the invention consists "also in the new article provided thereby." There is nothing in the original indicating that Harmatta ever supposed he had invented a new article. He neither described nor claimed such.

The matter on page 1, lines 34 to 97, inclusive, is, in its entirety, new matter. It is what Mr. Townsend, the draftsman of the amended specification, put in in October, 1912, not what Harmatta approved of and swore to in 1903.

This is the new stuff (p. 1, lines 34 to 97, Rec., p. 388):

"It has been before proposed to electrically weld two rods of metal together by a butt welding process, the area of union effected being substantially co-extensive with the cross section of the pieces at their meeting ends, that is to say, the weld has been made over substantially the whole area of the opposed portions of said pieces. It

has also been proposed to make a lap joint between the ends of two strips of metal by electrically uniting them together over substantially the whole area of the lapping surfaces.

A weld formed according to my invention is distinguished, however, from such prior welds, among other things, by the fact that the opposed surfaces available for uniting the pieces together and in which it might be possible to form a weld are welded in a small spot or spots only, the spot or spots being surrounded by comparatively large areas of opposed surfaces in which no weld is made.

By the term 'electric welding' as used herein I mean that well-known process in which the work is brought to the welding temperature by internal heat generated by the resistance of the work itself to the passage of an electric current at the place of contact between the parts to be joined by the welding pressure, and I disclaim those processes of fastening pieces of metal together in which the parts are heated and practically melted down by an electric arc generated on the back of the piece by 'drawing' an arc by means of the electrode, as well as other processes in which the welding heat is generated externally and electrically in a resistance material and is imparted to the work by heat conduction from said resistance material in contact with the work.

While it is possible, consistently with my invention, to localize the desired pressure and heating current at the desired distinct small spot or area in various ways, this may be accomplished conveniently by pressure applied over the spot and itself localized on the back of the plate or sheet immediately over the small spot in which the union is to be made by using a tool pressed against the work by its end and formed at such end so as to engage the work by a spot or area of small extent and serving, likewise, by preference, as the electrode which feeds the current into the work

to heat the same. The member which feeds the electricity being thus at the same time the tool, in this manner the most favorable conditions of working possible are secured, since as is well known, in really effective welding processes the place of welding brought to the proper temperature must be at once well hammered or pressed in order that the welding may be thorough."

The reference to the prior art is, of course, here but partial. It attempts to put out of the running welding by roller electrodes, though that was the principal thing disclosed and claimed by Harmatta originally, and, before him, by Thomson.

The statement as to "the spot or spots being surrounded by comparatively large areas of opposed surfaces in which no weld is made" was borrowed bodily from the Rietzel patent and finds no counterpart in the original Harmatta description.

The definition of electric welding "as used herein" as consisting of the "process in which the work is brought to the welding temperature by internal heat generated by the resistance of the work itself to the passage of an electric current at the place of contact between the parts to be joined," as distinguished from "other processes in which the heat is generated externally and electrically in a resistance material and is imparted to the work by heat conduction from said resistance material in contact with the work"—is wholly unwarranted by the original.

The original does not tell us of what material the electrodes are to be composed—does not say whether they are to be of high resistance or low resistance; does not say that they are of less resistance than the work; does not say that the heat is generated by resistance of the work itself or by the passage of the

current at the place of contact; and does not say that the heat is not generated externally in the electrodes and carried by heat conduction to the work. The disclosure of the original is quite consistent with the use of electrodes of relatively high resistance as suggested by the Benardos German patent, the Thomson patent 496,019, and the Stanley patent.

What Mr. Townsend, the draftsman of the Har-matta patent, wished the patent to show was that Har-matta appreciated and disclosed all of the essential principles and requirements of the most up-to-date application of resistance welding to the union of plates, and he, therefore, proceeded to make a description that would fill the bill, utterly regardless of the fact that in so doing he was setting forth that which Har-matta himself had never been guilty of disclosing or fathering, much less of swearing to.

Other examples of the interpolation of new substantive matter are found on page 2 of the specification. For instance, on lines 49 to 54 occurs the following:

“And the circuit is closed by any suitable means thus producing a flow of heating current through the work itself *substantially localized therein* so as to bring the same to the necessary welding temperature at the desired spot only,”

for which there is no predicate in the original.

Again, lines 69 to 82, is wholly new matter, viz.:

“The time or duration of pressure and heating and the amount of pressure as well as the volume of current for effecting the weld can be readily determined by experiment for different sizes or thicknesses of metal and as well understood in the art of electric welding to which my invention relates.

“The operation is completed with the cutting off of the flow of current in the usual manner practiced in the art of electric welding and the withdrawal of pressure when desired to permit the work to be withdrawn from position between the electrodes.”

And the description of the article produced is also wholly new, viz. (p. 2, lines 83 to 91, inclusive):

“Sheet metal work made by this process is readily distinguished from that made by prior processes by the comparative absence of burning, roughening or disintegration of the material on the back of the plate when the operation is carefully conducted. It further possesses the advantage that there are no rivet heads to mar the finish of the back or outer surfaces of the plate.”

As we have already pointed out, there was neither a specific description of, nor a claim for, the work or article in the original.

**The Product or Article Claims of the Harmatta Patent Are Invalid Because for New Matter Never Sworn to By Harmatta to Be of His Invention.**

The last five claims of the Harmatta patent, viz., claims 17, 18, 19, 20 and 21, are, in form, for products or articles of manufacture. They read as follows (Rec., p. 391):

“17. Metal plates fastened together by a number of distinct or isolated welds on their meeting surfaces and in spots comprising meeting portions of the metal plates, the backs of said plates being practically unaltered in their metallic condition and the spots on the meeting surfaces being

separated from one another by distinct unwelded areas.

18. Sheet metal work comprising pieces of sheet metal welded together in the material of their meeting surfaces and in spots only, each surrounded by distinct areas of unwelded union, the back surfaces of said pieces being substantially unaltered over the welded spots, substantially as and for the purpose described.

19. Composite metal work having its component pieces welded together in spots only involving the material of their opposed or meeting surfaces, said spots being each entirely surrounded by distinct areas of unwelded union and the portion of the pieces back of the welds being substantially unaltered as and for the purpose described.

20. Metal work comprising a metal plate fastened on its surface to the opposed surface of another piece of metal by a weld at a spot only in the material of the opposed surfaces, said spot being surrounded by a distinct area of unwelded union and the back surface of said plate being practically unaltered over said spots, as and for the purpose described.

21. A metal article comprising two bodies of metal having adjacent plane surfaces united at a plurality of spaced and isolated spots of integral and autogenous welded union, the metal at the spots of welded union having substantially the same qualities as at other points."

These claims first appeared in the application for the Rietzel patent. Claim 17 was claim 16 in the Rietzel application and was introduced there by amendment of March 13, 1909 (Rec., p. 1798); claims 18, 19 and 20 were claims 17, 18 and 19, respectively, of the Rietzel application and were introduced there by the amendment of May 7, 1909 (*Ibid.*, p. 1807); and claim 21 was claim 20 of the Rietzel application and intro-

duced there by amendment of June 23, 1909 (*Ibid.*, p. 1814).

When the Harmatta application was sworn to and filed in 1903, it contained no claims at all to a product or article. As we have seen, of the four claims originally presented one was for a method or process and three for machine or apparatus.

It was not till March, 1910, over six years later, and after the Rietzel patent had issued, that the claims, copied word for word from the Rietzel patent, were inserted by amendment in the Harmatta application and the interference between Harmatta and Rietzel declared.

Comparison of the Harmatta patent with the Rietzel patent will disclose that claims 17, 18, 19, 20 and 21 of Harmatta and claims 16, 17, 18, 19 and 20 of Rietzel are identical.

Under Section 4886 of the Revised Statutes of the United States, patentable subjects-matter are divided into "art (process), machine, manufacture or composition of matter." These subjects are regarded as so distinct that a patent for a machine may not be reissued to cover a process (*Eachus vs. Broomall*, 115 O. G., 429), and a patent for a process may not be reissued to cover a product (*Powder Co. vs. Powder Works*, 98 U. S., 126), since in neither case will the reissue be for "the same invention."

Now, Harmatta applied for and claimed (1) a certain process (and not that claimed in his patent), and (2) a machine. He never swore to have invented anything else.

The introduction of claims for a product or article by his solicitors was unwarranted, just as was the introduction of a process claim in an apparatus application in *American Lava Co. vs. Steward*, 155 Fed., 731-



736, 738 (C. C. A-6); *Steward vs. American Lava Co.*, 215 U. S., 161. This point was sustained by the trial court (Rec., pp. 41-42).

**The Product or Article Claimed By Harmatta is Indistinguishable From That Claimed By Rietzel and Plaintiff is Estopped to Contend to the Contrary.**

As we have seen, the product or article claims of the Harmatta patent were first put into the *Rietzel* patent by the Thomson Company's lawyer, Mr. Townsend, after knowledge of Harmatta's foreign patents had been brought home to him, and after the art of electrically welding plane-faced metal plates had been fully developed commercially by others than Harmatta. They were put into the *Harmatta* patent by the same skillful practitioner, with a view to again covering such product or article in the most complete manner possible, whether resulting from the welding of plane-faced plates or plates one or both of which were formed with slight projections.

It is significant that with all his ingenuity, Mr. Townsend was then, unable to describe the product or article made by the use of the Harmatta apparatus so as to distinguish it from the product or article made by the Rietzel apparatus. In other words, he regarded the two products as practically indistinguishable, as indeed they are.

By adopting the claims from Rietzel, who only *illustrated* the welding of plates provided with projections, and provoking an interference with Rietzel with respect thereto, and obtaining a judgment on that basis, plaintiff's predecessor and those claiming under him, including the plaintiff, are now estopped to assert that the said claims cover only a product or article re-

sulting from the welding of plane-faced plates, and not a product or article resulting from the welding of plates, one or more of which are provided with projections.

Here, again, the plaintiff is not permitted to blow hot and then cold. The same interpretation that was given the claims when they were obtained must be now given them when they are sought to be enforced against this defendant.

Inasmuch, therefore, as the present claims of Harmatta cover a product formed from plates having (one or more of them) pre-formed projections through which the welds are formed—which plaintiff is estopped to deny—it follows that such claims are all invalidated by the prior Robinson and Kleinschmidt patents which show products of this character.

#### **THE PRIOR INVENTION OF SEBASTIAN ZIANI DE FERRANTI**

The prior invention of Sebastian Ziani de Ferranti, of London, England, as disclosed in the Provisional application forming part of his British Patent, No. 11,921, of 1903, filed May 25, 1903 (Rec., p. 1479) affords still another answer to the Harmatta patent and justifies a separate discussion.

It should be explained that on May 14, 1904, while the Harmatta U. S. application was pending, but before the claims for process or product were amended into it, and before the application for the Rietzel patent was filed, de Ferranti filed in the United States Patent Office an application corresponding to his Provisional application previously, to-wit, on May 25, 1903, filed by him in Great Britain. This U. S. application was afterwards divided into several divisions,

one of which, namely, that filed on the 29th day of December, 1911, was, on the 2d day of October, 1913, put into interference with the Harmatta patent.

The subject-matter of that interference consisted of broad claims 1, 2, 3 and 4 of the Harmatta patent, which, as we have seen, were copied *verbatim*, by Harmatta from the Rietzel patent, No. 928,701, being claims 1, 2, 3 and 4 of the latter patent.

For the purpose of giving the Court a clear and comprehensive idea of the fullness of the disclosure of the de Ferranti British Provisional Application, and of its application to the issues of the interference, we cannot do better than quote from the testimony of Mr. Dyer, defendant's expert, given in the interference proceeding.

Mr. Dyer testified as follows (Rec., p. 1642):

"The de Ferranti provisional specification refers to the difficulties experienced by the patentee 'in electrically welding together the two parts which differ considerably as regards their power of rising to the required welding temperature when heated at the point of junction' (page 1, lines 6-8). It is, therefore, clear that the specification relates to an electric welding process in which the welding heat is secured by the resistance of the two pieces to be joined as distinguished from processes in which an electric arc is used. In a broad and general sense this is the so-called Thomson process originally invented and patented by Prof. Elihu Thomson about the year 1886. In the de Ferranti provisional specification the inventor refers to the desirability of so carrying the process out as to secure substantially uniform welding conditions at the point of junction when the two parts which are welded together differ considerably in mass, or in other respects differ considerably as regards their power

of rising to the required welding temperature. The specification discloses a number of ways by which the welding process may be carried into effect, some of which, in my opinion, comply with the limitations of the claims in issue herein. I have prepared and present herewith drawings illustrating the several suggestions made by de Ferranti and disclosed by him in the provisional specification. Figure 1 illustrates the suggestion that 'grooves may be cut across the edge of the ring' (lines 20 and 21). With this suggestion, assuming the invention is carried out in connection with welding a series of turbine blades to a suitable carrier, the turbine blades will be welded to projections on the carrier by a butt-welding process and not by the particular method disclosed in the claims in issue. Figure 2 discloses the arrangement suggested by de Ferranti in the statement 'or several grooves may run circumferentially completely around the edge (page 1, lines 21 and 22). In this figure I also illustrate on an enlarged scale the under face of one of the turbine blades showing the area of the several welds by section lines. These welds in Figure 2 correspond to the spots or distinct or separate spots separated from one another by well defined areas of no union as defined in the claims in issue. In other words, with the arrangement shown in Figure 2, the welds occupy only a part of the surfaces to be secured together, thus localizing the current within circumscribed paths and effecting a more rapid and economical welding operation than when the entire area of the surfaces constitute the weld. In Figure 3, I illustrate the suggestion of de Ferranti described by the words 'or, again, intersecting sets of grooves inclined to one another may be cut on the edge of the ring' (page 1, lines 22-23). In this figure I also show on an enlarged scale the underside of one of the parts (in this case a turbine blade) illustrating by sectional lines the well defined spots or areas constituting the

plurality of welds and by means of which the welding current will be localized within restricted or circumscribed areas. This particular figure is that of the de Ferranti drawing in interference and manifestly it corresponds with the restrictions and limitations of the claims. In Figure 4, I illustrate the arrangement which is described by the words 'radial holes may be bored a short distance into the edge, either arranged in patterns, so as to leave intervening projections of untouched metal to which the blades may be welded' (page 1, lines 24-26). The weld in this case corresponds substantially to Figure 1, is co-extensive with the entire area of the turbine blade and does not correspond with the limitations of the issue. In Figure 5, I illustrate the arrangement disclosed in the de Ferranti provisional specification by the words 'or arranged without particular reference to the position of the blades' (page 1, lines 26-27). In this figure I show on an enlarged scale the under face of the turbine blade illustrating the area of the welds which are arranged in spots or defined areas so as to localize the heating current and this arrangement also, like those of Figures 2 and 3, corresponds to the limitations of the issue. In Figure 6, I illustrate the suggestion made in the provisional specification and described by the words, 'Again, the result aimed at may be secured by boring holes through from face to face of the ring at a radius slightly less than that of its outside edge' (page 1, lines 32-33). With this suggestion the area of the weld will correspond to the entire engaging face of the turbine blade and therefore this particular suggestion does not correspond with the limitations of the issue. In Figure 7, I illustrate the suggestion described in the provisional specification by the words 'the ring may be built up of two or more thinner rings held in their relative positions by distance pieces or in any other convenient manner, the blades being then welded in position on

their outside edges' (page 1, lines 34-37). In this figure I also illustrate on an enlarged scale the bottom face of the turbine blade illustrating by sectional lines the area of the welds which are thus located in spots or well defined areas by which the heating current will be localized. Finally, in Figure 8, I illustrate the arrangement described by de Ferranti in the provisional specification by the words 'Again, the ring may be built up of a set of laminae, the edges of which are notched, the laminae being assembled in such a way that the notches are "stepped" with regard to each other, the intervening projection of metal thus following the shape of the turbine blades to be welded to them' (page 1, line 38; page 2, line 2). Assuming that with this arrangement the laminae are arranged closely together so that the projections referred to will constitute a substantially continuous surface to which the turbine blades are electrically welded, I find that with this suggestion the weld will occupy substantially the entire area of the bottom face of the turbine blade and will not correspond to the limitations of the issue. I do find, however, that the de Ferranti provisional specification, as illustrated in Figures 2, 3, 5 and 7, suggests a method of welding electrically two pieces of metal together wherein the welds will be confined to fixed, definite, limited areas or spots, by which the heating current will be localized, and in connection with these several suggestions made by de Ferranti of spot welding the two metallic parts, which may be obviously of any suitable character, I call particular attention to the following statement made in the provisional specification:

'The object to be kept in mind in this as in other modifications, is to remove sufficient metal to enable the temperature to rise to the welding point as explained above, while at the same time leaving sufficient areas untouched to insure due me-

chanical strength in the welded joint' (page 1, lines 33-36).

From these instructions of the inventor I understand that when a process is carried out, such as disclosed in Figures 2, 3, 5 and 7 above explained, the areas of non-union are made as extensive as possible so long as the isolated or spot welds provide 'due' mechanical strength. de Ferranti does not suggest that at all times the maximum mechanical strength in the weld is to be secured, because it is obvious that if conditions are equal a weld extending over the entire area of the bottom face of the turbine blade is mechanically stronger than a weld which occurs only in isolated spots or restricted areas. The provisional specification points out that so long as 'due' mechanical strength is secured, that alone is sufficient and with this in view the areas of non-union may be as extensive as possible.

Now referring to the suggestions contained in the provisional specification and illustrated in Figures 2, 3, 5 and 7, to which I have above referred, I find that there is here disclosed a method of fastening two pieces of metal together by electrically welding them to one another at spots only of their juxtaposed or opposite faces by the application of pressure and heating current localized in such spots as defined in Claim 1 of the issue herein. Furthermore, I find that in these disclosures is suggested the method of uniting two pieces of metal at a number of distinct or separate spots separated from one another by well defined areas of no union consisting in applying pressure localized at the spots of desired union, and passing electric current through the pieces from one to the other while confining the flow of current to said spots until the union is effected, as defined in claim 2, in issue herein. Furthermore, I find that in these figures, taken from the provisional specification, is disclosed a method of

uniting two pieces of metal consisting in pressing them together while passing a heating electric current from one to the other and localizing the flow of current and the heating throughout the operation in a spot, or spots, of circumscribed or limited area as compared with the area of the immediately opposed surfaces so as to limit the union of the pieces to a spot, or spots, as defined in Claim 3 in issue herein. And, finally, I find that in these particular disclosures of the de Ferranti original specification, a method is suggested of uniting two pieces of metal at a spot or spots only in their opposed heating surfaces, consisting in pressing the two pieces together, and passing a welding electric current from one to the other, while localizing the pressure in and confining the flow of current to the spot, or spots, of desired union so as to produce an isolated spot, or spots, of union, leaving distinct or well defined areas in which the pieces are not welded together, as defined in Claim 4 in issue herein."

The declaration of this interference with de Ferranti came as a surprise to the Thomson Electric Welding Company, the then owner of the Harmatta patent, and it meant that if de Ferranti could establish priority in respect to the issues of that interference the Harmatta patent was defeated.

The owner of the Harmatta patent was indeed badly caught. It had, as we have seen, prosecuted the application for the Rietzel patent (in blissful ignorance of the existence of the then pending United States Harmatta application), procured Rietzel to swear back of the Harmatta foreign applications by asserting inventorship in 1897-8, then drawn claims for Rietzel covering completely not only his disclosure but the Harmatta foreign disclosures as well, then taken the patent in Rietzel's name, then having



acquired Harmatta, caused Rietzel to default in the interference with Harmatta, in order that judgment might be rendered against him and in favor of Harmatta, and then issued the patent to Harmatta, only, finally, to run up against an interference with de Ferranti, who claimed the right, under the law, to hark back to his prior British application of May 25, 1903, as his date of constructive reduction to practice, and thus establish priority over Harmatta, the date of whose United States application was December 3, 1903, and the established date of whose foreign application was not earlier than October, 1903:

de Ferranti v. Lindmark, 30 App. D. C. 417;  
 Winter & Eichberg v. Latour, 35 App. D. C. 415;  
 Burt v. Coats & Cameron, 47 App. D. C. 185;  
 Jay v. Weinberg, 250 Fed. 469-472, Sec. 4887,  
 R. S. U. S.;  
 International Convention, 25 Stat. at Large,  
 1383.

The worst of the situation was, that, having originally drawn the claims of the issue in a case (Rietzel's) which showed only the "spot welding" through projections on one or both of the parts to be welded, the owner of the Harmatta patent was now estopped to deny the application of the claims to the similar earlier work of de Ferranti. Finding itself thus caught, the owner of the Harmatta patent entered upon a campaign of disentanglement.

It proceeded at once to move to dissolve the interference on the ground, first, that de Ferranti had no right to make the claims in issue because his original application disclosed only a process of butt welding; secondly, because the claims in issue were based upon new matter not embraced in his original application

but inserted for the first time in the divisional case in interference; and, thirdly, because he did not make the claims in issue until more than three years after the publication of the same claims in the Rietzel patent, No. 928,701, on July 20, 1909 (Rec., p. 1502).

This motion was referred to the Law Examiner for disposition and he decided that de Ferranti did have the right to make the claims in issue (Rec., p. 1528, *et seq.*). A rehearing was applied for and denied (*Ibid.*, p. 1535).

Other motions to dissolve, not necessary here to detail, were made in behalf of Harmatta and overruled, and, finally, after testimony had been taken by both sides on the question of the identity of the disclosure of the de Ferranti United States application with that of the de Ferranti British Provisional, the case was submitted to the Examiner of Interferences, who decided, first, that the invention of the issues was not found in the de Ferranti British Provisional application, and, secondly, that de Ferranti was, under the decision of the Court of Appeals of the District of Columbia, in the case of Rowntree vs. Sloan, 45 App. D. C. 207, estopped to assert the claims in issue, because they had not been made by him within a year of the date of the publication of the Rietzel patent, No. 928,701, of July 20, 1909.

On appeal to the Board of Examiners-in-Chief, the Examiner of Interferences was reversed, on the first point, and sustained on the second,—the Board holding that the disclosure of the British Provisional application of de Ferranti was sufficient to enable him to go back to it as his date of effective reduction to practice, under the Statute, but holding further that the decision in Rowntree vs. Sloan was controlling of them and required that they decide that de Fer-

ranti, by reason of his delay of about seventeen months in making the claims, was barred of his right to make them.

In their decision, on the first point, the Board said (Rec., p. 2079):

“de Ferranti’s provisional application is particularly directed to a process of attaching turbine blades. And the object of the invention is stated to be the reduction of the large amount of metal theretofore appearing in the turbine ring to which the blades are welded, so as to reduce the flow of heat from the vicinity where the blade is welded to the ring. de Ferranti described in his provisional application several different forms or processes, some of which clearly do not come within the scope of the counts. The provisional specification did not comprise a drawing.

We find that de Ferranti’s witness has fairly set forth the inferences which those skilled in the art would draw from this provisional application. de Ferranti’s Exhibit No. 1 correctly shows, in our opinion, what those skilled in the art would understand this provisional application to describe. In making the structures of figures 2, 3, 5 or 7 of this exhibit as described in the provisional application, those skilled in the art would infringe the claims which constitute the counts of this interference.

Nor can this disclosure be regarded as accidental merely because the functions and advantages thereof which underlie the invention here in controversy were not appreciated by de Ferranti. They are inherent in his process as disclosed when carried out in the manner indicated in figures 2, 3, 5 and 7 of de Ferranti’s Exhibit No. 1.

Nor can this disclosure be regarded as accidental merely because de Ferranti also disclosed the forms or methods indicated in figures 1, 4 and 8 of this Exhibit No. 1 which do not involve the pro-

cess here in issue. When an inventor positively and definitely describes two or more structures or processes, he is not any the less a discloser and inventor of any one of these than he would have been had he disclosed only that one.

In this connection it is noted that Harmatta's application in interference shows a somewhat similar lack of appreciation of the present invention when originally filed. The emphasis and claims therein were to the application of pressure to the weld through the electrodes though the present process was unmistakably disclosed.

We hold that the Examiner of Interferences erred in not finding the invention in controversy to be adequately disclosed in the de Ferranti provisional application."

The de Ferranti Exhibit No. 1 referred to in the above quotation is found reproduced in the record (Rec., p. 1666, *et seq.*).

On the second point, the Board of Examiners-in-Chief said (Rec., p. 2080):

"Taking up the question of estoppel we find that de Ferranti appears to have first asserted claims to the present invention on *December 6, 1910*. As Harmatta's patent did not issue until 1912 de Ferranti is not barred by the same from prevailing here. But the counts of this interference were drawn from a patent to Rietzel, No. 928,701, which issued upon July 20, 1909. Harmatta made claims to the present invention at least as early as March 31, 1910, and an interference was declared between his application and the Rietzel patent upon April 26, 1910. If de Ferranti had been claiming the present invention at that time he would presumably have been placed in that interference. It is true that the Examiner could have taken steps toward the inclusion of de Ferranti's application in that interference at any

time after December 6, 1910, when de Ferranti first laid claim to the present subject-matter. This was presumably overlooked by the Examiner. If the claims that de Ferranti advanced on December 6, 1910, had been advanced before July 20, 1910, he would not have been estopped even though the Examiner did not take steps looking to the addition of de Ferranti to the Rietzel-Harmatta interference. As it is, however, de Ferranti did not make any claim until more *than a year after* the issue of the Rietzel patent, whereas Harmatta did do so and has prevailed over Rietzel in an interference proceeding. We think that the reasons underlying the decision in Rowntree vs. Sloan, *supra*, apply to the present case and that de Ferranti is accordingly estopped to assert priority over Harmatta."

After this case was submitted to the Trial Court the interference, de Ferranti v. Harmatta, was further reviewed on appeal, first by the Commissioner of Patents, and then by the Court of Appeals of the District of Columbia.

The Commissioner held that the subject-matter in issue was not disclosed in the de Ferranti British Provisional specification and awarded priority of invention to Harmatta on that ground. The Court of Appeals, without reviewing the Commissioner's finding as to the sufficiency of the British Provisional specification, held that de Ferranti was barred and estopped from receiving a patent because he had not made the claims of the issue within two years of the grant of the Rietzel patent of July 20, 1909, in which such claims had originated; basing its decision upon the holding of this Court in Chapman & Chapman vs. Wintroath, 252 U. S., 126, which decision it construed as placing a two years' limitation upon an ap-

plicant's right to make claims instead of the one year limitation which it, the Court of Appeals, had held applicable in the same case when before it (47 App. D. C., 247) and in the previous case of Rowntree vs. Sloan, 45 App. D. C., 207.

The opinion of the Court of Appeals is reported in 50 App. D. C., 393; 273 Fed., 357.

The decision of the Court of Appeals was, in our view, wrong, for two reasons, to-wit:

(a) It assumed that this Court in *Chapman vs. Wintroath* had decided that a two-years' delay in making a claim after its appearance in a prior patent was fatal, whereas it did not and could not have decided any such thing, the case before it not presenting any such question. In the case before it, the applicant's delay was only about nineteen months. The Court of Appeals applying the one year rule held the delay fatal. This Court overruled this one year rule, stating that, in analogy to many of the statutory provisions permitting at least two years' grace for action by an applicant or patentee the delay of nineteen months in the case before it was justified; which was a far cry from *deciding* that in no case was a delay of more than two years permissible.

(b) The Court of Appeals overlooked the fact that *de Ferranti* had in fact first claimed the substance of the issues in interference not without but well within two years, if that period were the legal limitation. The Board of Examiners-in-Chief so held in their decision. (p. 162, *ante*.) That this is so will be seen from a comparison of some of the claims made in the *de Ferranti* parent application (of which the application in the interference was a division) with claims of the *Rietzel* patent constituting the counts of the interference issue:

Claims, 1, 2, 3, and 4 of Rietzel Patent No. 928,701 of *July 20, 1909*, constituting the Issues of the de Ferranti-Harmatta Interference. (Rec., p. 1101.)

1. The hereinbefore described improved method of fastening two pieces of metal together by electrically welding them to one another at spots only of their juxtaposed or opposite faces by the application of pressure and heating current localized in such spots.

2. The herein described method of uniting two pieces of metal at a number of distinct or separate spots separated from one another by well defined areas of no union, consisting in applying pressure localized at the spots of desired union, and passing electric current through the pieces from one to the other while confining the flow of current to said spots until the union is effected.

Claims made on *December 5, 1910*, in de Ferranti's parent application No. 208,034 of May 14, 1904, of which the later application of December 29, 1911, involved in de Ferranti-Harmatta interference is a division. (Rec., pp. 1267-1273.)

8. A process for uniting two parts together consisting in utilizing portions only of the individual juxtaposed surfaces for the transference of electric heating current so as to limit the heating effect of said current substantially to said portions and applying pressure so as to unite the parts by a weld of less area than that of the juxtaposed surfaces.

9. A process for uniting two parts together consisting in utilizing portions only of the individual juxtaposed surfaces for the transference of an electric current, the utilized portions being prepared so as to localize the heating effect of said current and applying pressure to unite the parts by a plurality of isolated electric welds.

3. The herein described method of uniting two pieces of metal, consisting in pressing them together while passing a heating electric current from one to the other and localizing the flow of current and the heating throughout the operation in a spot or spots of circumscribed or limited area as compared with the area of the immediately opposed surfaces so as to limit the union of the pieces to a spot or spots.

4. The improved method of uniting two pieces of metal at a spot or spots only in their opposed meeting surfaces, consisting in pressing the two pieces together, and passing a welding electric current from one to the other while localizing the pressure in and confining the flow of current to the spot or spots of desired union, so as to produce an isolated spot or spots of union, leaving distinct or well-defined areas in which the pieces are not welded together.

10. A process for uniting two parts together consisting in leading an electric current across portions only of the individual juxtaposed surfaces of the parts and applying pressure to said parts so as to integrally unite the individual juxtaposed surfaces together by a plurality of isolated electric welds.

11. A process for uniting two parts together consisting in forming projections on the individual juxtaposed surfaces of said parts, leading an electric current across the parts by way of said projections and applying pressure to unite the individual juxtaposed surfaces by a plurality of isolated electric welds.

The exact words of the Rietzel claims were not used by de Ferranti in the drafting of his claims but there



cannot be the slightest doubt of the identity of the two sets of claims in matter of substance.

The later adoption by de Ferranti of the precise phraseology of the Rietzel claims for purposes of interference with Harmatta, who had copied and adopted such claims literally, was mere compliance with technical Patent Office procedure and cannot possibly operate prejudicially to de Ferranti in matter of essential right.

The plaintiff will doubtless contend here, as it has done in the de Ferranti-Harmatta interference, that the first four claims of the Harmatta patent are limited to a process for uniting plane-faced plates and that de Ferranti does not disclose such a process but only a process for uniting pieces one or both of which are provided with projections through which the welding takes place; but the complete answer to this is that these four claims originated in the Rietzel patent and were inserted there to cover the welding of plane-faced plates as well as the welding of plates provided with projections; were copied by Harmatta for interference with Rietzel; were adjudged to belong to Harmatta over Rietzel in such interference, and the plaintiff, now claiming under Harmatta, is estopped to deny that they include a practice like de Ferranti of welding plates or pieces having projections through which the welding takes place.

We would here remark that the question of priority of invention as between de Ferranti and Harmatta is still open, notwithstanding the judgment of the Court of Appeals of the District of Columbia, de Ferranti and his assignee having filed a bill in equity against Harmatta and his assignee in the United States District Court for the District of Massachusetts under

Section 4915, R. S. U. S., for a review of such judgment.

It is only necessary to add that the defendant here is a lawful licensee, under the de Ferranti invention and application and has *pro tanto*, a right to all the protection that the law affords de Ferranti himself (Rec., pp. 1972, 1975, 1978, 1980).

What has been said in regard to de Ferranti's priority respecting the process or method claimed for Harmatta, applies equally well to the product or article claimed by him. Both process and product are anticipated by de Ferranti.

#### THE BEARING OF CHAPMAN & CHAPMAN VS. WINTROATH, 252 U. S. 126, ON THE HAR- MATT A PATENT AS A WHOLE

If our interpretation of the decision of this Court in Chapman & Chapman vs. Wintroath (p. 164, *ante*) be wrong and plaintiff's interpretation be right, then that decision must have a profound bearing on the validity of the Harmatta patent as a whole.

That case, as we have seen, came up from the Court of Appeals in the District of Columbia on writ of certiorari. The Court of Appeals had held that the delay of Chapman & Chapman in asserting the claims in controversy after a patent containing them had been issued to their adversary Wintroath nineteen months previously, constituted such laches and abandonment as to deprive them of a right to a patent, notwithstanding the fact that their application was filed earlier than the application for the patent of Wintroath first containing the claims. This Court reversed the judgment of the Court of Appeals on the ground that according to all time analogies to be found in the

patent Statutes and the decisions of this Court thereunder, especially in reissue cases, the applicants had two years within which to assert their claims, and because their delay was less than two years they were not barred.

While in Harmatta's case there was no patent claiming the identical subject-matter issued to an adversary more than two years before he made the claims now standing in his patent, there was a public use of the process covered by those claims and of the product covered by those claims, by his assignees and licensees, in this country, for over *five* years before any of those claims were introduced into his application and there was a publication and patenting of those claimed inventions by himself in Great Britain, France and other foreign countries more than *seven* years before the making of the claims in his U. S. application. There would seem, therefore, in Harmatta's case, to be present the full equivalent of a prior patenting for over two years claimed by plaintiff to be laid down in the Chapman case as constituting fatal laches or abandonment of right.

**THE PRIOR SUIT ON THE HARMATTA PATENT  
AGAINST BARNEY & BERRY, INC., WAS  
FEEBLY DEFENDED AND OUGHT NOT BE  
GIVEN BUT LITTLE, IF ANY, WEIGHT.**

On March 13, 1913, about three months after the Harmatta patent was issued, a suit for infringement of that patent was brought in the United States District Court for the District of Massachusetts by the Thomson Electric Welding Company (as owner) and Universal Electric Welding Company (as exclusive licensee) against Barney & Berry, Inc., a Massachusetts

Corporation, which latter was using in the welding of the parts of skates, an electric welding machine built and sold by The Toledo Electric Welding Company of Ohio.

The trial of that suit came on April 1, 1914, before his Honor, Frederic Dodge, District Judge, who, on March 24, 1915, found the patent invalid and entered a decree dismissing the bill of complaint (227 Fed., 428). Appeal being taken from this decree to the United States Circuit Court of Appeals for the First Circuit, that Court, on October 5, 1915, reversed the decree of the Court below and remanded the cause for further proceedings (227 Fed., 428; Rec., p. 5). Subsequently, to-wit, on July 17, 1916, an interlocutory decree was entered on the mandate referring the cause to a master to take and state an account (Rec., p. 1982). It does not appear that any final decree was ever entered in the cause. But it does appear that the cause was settled by agreement of the parties, without an accounting (see Pamphlet of Contracts, Rec., p. 805).

Those, other than the plaintiff and its licensees, engaged in the manufacture and use of spot welding machines have never had any confidence in the Barney-Berry litigation as settling the question of the validity of the Harmatta patent. Even the plaintiff itself has shown lack of dependence upon it, for, notwithstanding the decision of the Court of Appeals sustaining the patent, no suit on the patent, other than the present one, has ever been brought on it, out of the First Circuit, and, in the present suit, the plaintiff has not had the temerity to apply for a preliminary injunction, so impressed has it evidently been with the weakness of its position.

After the decision of the Circuit Court of Appeals, over four hundred manufacturers and users of spot

welding machines located in different parts of the country and representing many millions of invested capital, banded themselves together under the name of the "Welding Patents Investigating Committee," for the purpose of gathering materials of defense against the possible aggressions of the plaintiff (see Defendant's Exhibit Bulletin No. 21, July 17, 1917, offered Rec., p. 1001).

While the defendant has made several contributions to the fund raised by this committee, they were always paid with the distinct understanding that defendant would not be thereby bound to assist in the defense of any suit brought against any other contributor, and, consistently with this determination, defendant has itself borne all the expenses of this suit and has had full and exclusive control of the same (Hartman, Rec., p. 1000).

The general distrust of and failure to yield acquiescence to the decision rendered in the Barney-Berry case has been based upon the following considerations, among others:

(1) Barney & Berry, Inc., was but a nominal defendant in that case, while the real defendant was the Toledo Electric Welding Company, and its secretary and general manager, Mr. Frank Warren, was, before and during the trial negotiating with the plaintiff a plan of settlement inconsistent with a full, whole-hearted defense of the suit (McBerty, Rec., p. 802; see also Defendant's Exhibit 72, Rec., p. 2073).

Immediately after the decision of the Court of Appeals in that case the plaintiff bought out the Toledo Electric Welding Company—lock, stock and barrel—took Mr. Frank Warren into its employment, at a salary of \$7,500 per annum, for three years, and agreed to give Mr. Warren additional compensation out of all

sums received thereafter by plaintiff or any subsidiary company engaged in the electric welding business, to-wit, 15 per cent of the first \$50,000; 10 per cent of the second \$50,000, and 5 per cent of all additional amounts received.

(2) Although the prior knowledge and use of Rietzel was well known to plaintiff and, presumably, to defendant in that case—the file wrapper of the Rietzel application for patent disclosing it—such knowledge and use was apparently deliberately suppressed and not brought to the attention of the Court in that case.

(3) Although the prior knowledge and use of McBerty set up in this case was known to plaintiff and defendant in that case, the same was likewise suppressed and not brought to the attention of the Court.

(4) Although the prior invention of de Ferranti and the existence and pendency of the Harmatta-de Ferranti interference were well known to both plaintiff and defendant in that case, the same were suppressed and not brought to the attention of the Court.

(5) Although the practicability of roller electrodes for carrying out the process was well known to plaintiff in that case and asserted by Harmatta himself, attempt was made to deceive the Court in this particular.

(6) The fact that in that case the Thomson patent No. 496,019 was attempted to be disposed of as embodying a mere process of soldering and not a welding process, although the plates described as being united by electric current and pressure were iron plates coated with tin—the only material, specifically designated anywhere by Harmatta, to-wit, in the Harmatta French patent No. 336,187, as composing the plates proposed to be united by his process.

(7) The fact that it was generally believed that Judge Dodge was right in holding that the roller-elec-

trode patent of Thomson, No. 444,928, constituted a complete anticipation of the Harmatta patent, notwithstanding his reversal on appeal as to this point by the Court of Appeals.

(8) The fact that the Lemp patent, No. 553,923, owned by the plaintiff and well known to the defendant in that case, was not set up at all, though constituting a clear anticipation of the Harmatta patent.

(9) The fact that in that case the Kleinschmidt patent was attempted to be disposed of as an anticipation of Harmatta on the basis of disclosing only the production of *big* spot welds instead of small spot welds, the plaintiff and defendant both well knowing that the size of the welds had nothing to do with the claimed process, or the claimed product of Harmatta, as established in this case.

(10) The fact that in that case the Robinson patent, No. 574,942; the Burton patent, No. 647,694; the Parkinson British patent, No. 14,536, of 1894, were entirely overlooked, or not exploited, as anticipations of the Harmatta patent.

(11) The fact that in that case the Benardos German patent No. 50,909 was not presented in its true bearing as an anticipation of the Harmatta patent.

(12) The fact that in that case the estoppel growing out of the assertion by plaintiff of the prior invention of Rietzel as a means for securing the grant of the Rietzel patent over the foreign anticipating disclosures of Harmatta and for securing to Rietzel a "look-in" in the Rietzel-Harmatta interference, was not urged against the plaintiff, though known to the defendant in that case. The Trial Court in the case at bar, was impressed with defendant's criticisms of the Barney-Berry case and so expressed itself (p. 27).

### Judge Dodge's Decision

Notwithstanding the fragmentary and partial exhibition of the prior art in the Barney-Berry suit, Judge Dodge found enough in the prior patents laid before him, and particularly in the Thomson roller-electrode patent, No. 444,928, and in the Kleinschmidt patent, No. 616,436, to invalidate the Harmatta patent.

Of the Thomson patent he said (227 Fed., p. 431):

“Referring again to the Thomson patent, No. 444,928, the process therein described, while it is said to be ‘especially applicable to the welding of plates together at their edges, instead of riveting,’ is just as applicable to the welding of plates or sheets at other places within their area as at their edges. The roller electrodes employed, when brought together on each side of the work, and until something more is done, will pass the electric current and make the weld at the spot or point of pressure and nowhere else. (See claim 1 of the patent referred to.) If, having then made the weld, they should be again separated, instead of having the work fed between them while their pressure upon it continued, they would leave an isolated spot weld joining the plates and be in readiness to make another weld isolated from the first by any desired area of unwelded surface.

“The plaintiffs say that although machines were built to carry out the roller process of the last mentioned patent, they were not practically successful and that the process has proved a failure so far as commercial success is concerned. Their evidence tends to support this contention and to show that there are practical difficulties attending the use of the process. But so far as the question raised is important, I think the plaintiff's evidence tending to show want of success is fully met by that of the defendant; according to which the process has been successfully carried



out by machines built and commercially installed by at least two different concerns. Samples of the work they have produced by using it are among the exhibits in the case and there is nothing to show that such work is unsatisfactory in character."

Had the learned judge been fortified, further, by the admissions of plaintiff's witnesses, in this case, he would not have felt the need of even discussing the practicability of practicing the Harmatta process by means of roller electrodes.

(Gravell, Rec., p. 103, X-Q. 191; p. 104; X-Q. 199, *et seq.*; Knapp, *Ibid.*, p. 221, X-Q. 27, *et seq.*; Knapp, Jr., *Ibid.*, p. 233, X-Q. 20, *et seq.*; Clark, *Ibid.*, p. 263, X-Q. 114 *et seq.*; Thomson, Rec., p. 532, Q. 28.)

But the learned judge did not overlook the fact that Harmatta himself had asserted the entire practicability of practicing his process by means of roller electrodes, and had, in fact, described roller electrodes as the principal, and pin electrodes as the mere incidental or subordinate, means of carrying out his process.

We quote from his opinion on this point, as follows (227 Fed., p. 432):

"As has appeared, the application was pending for ten years before the patent issued.

"As originally filed the application described a process of roller welding substantially like that of Thomson, with the statement toward the close of the specification that, instead of introducing the piece to be welded gradually between the electrodes, the welding apparatus might be arranged to slide relatively to them, and that if required

to weld sheets only at particular places, apparatus employing electrodes and having the form of pins might be used, instead of the roller electrodes, to produce 'a small, round, very sharply defined place of welding,' answering the purposes of a rivet.

"There were two claims covering roller welding and two others not thus limited. The idea of roller welding thus appears to have been with Harmatta the foundation and origin of his further idea of spot welding, and his further idea to have consisted in nothing more than stopping with the first point welded instead of continuing it into a welded line."

### The Decision of the Court of Appeals for the First Circuit

As compared with the well reasoned opinion of Judge Dodge, the opinion of the Court of Appeals, written by Judge Putnam, makes a poor showing.

It swallows, bait, hook and sinker, the plaintiff's contention that the roller electrode process is entirely impracticable and throws the Thomson roller electrode patent No. 444,928 and Harmatta's evidently preferred form of roller electrode apparatus disclosed in his original application and in all his foreign patents, into the discard, contrary to the weight of evidence in that case and the full admission of plaintiff in this one.

It errs in its statements as to what the record contained, indicating (what was probably the fact) that the record had never been read. It says (Rec., p. 7):

"The patent was applied for on December 3, 1903, and was not issued until December 3, 1912, *but the claim for spot welding was always in the application.*"

Now, the fact is, that of the four claims originally sworn to by Harmatta, the first two covered, respectively, a process and an apparatus which entirely disregarded the form of electrodes employed or the welding in disconnected spots as distinguished from the welding in a line. They read (Rec., p. 1361):

"1. The process of electric welding, consisting in employing the electrodes not only to conduct the current to the objects being welded, but also to exert a regulable pressure on the same, substantially as described.

"2. An electrode apparatus for electric welding, comprising two electrodes between which the objects to be welded are introduced and means whereby one of the electrodes can be approached to and receded from the other, substantially as described."

The two other original claims (3 and 4) were, as we have seen, directed specifically to the roller electrode apparatus only.

The opinion of the Court of Appeals goes on further to state:

"The alleged infringing machines were first constructed in 1908; in 1910 the application covered both spot welding and line welding. It was then amended by striking all claims for line welding," etc.

This was an inaccurate and untrue statement. By the amendment of May 14, 1904, everything relating to line-welding, *i. e.*, description, claims and drawings, was stricken from the Harmatta application and *never* thereafter reappeared in it!

From the whole temper of the Court of Appeals'

opinion, the impression is gained that the Court thought defendant's whole case rested upon the roller-electrode defense and that it had been shown that all roller electrode apparatus were impracticable and had been jettisoned, even by Harmatta, for that reason—contrary to what we now know and what the plaintiff's witnesses in this case admit to be the fact.

It is apparent, therefore, that, had the evidence now in this case, on this point only, been before the Court of Appeals in Massachusetts, a different result would have been reached by that Court, to say nothing of what would have been the effect of the other defenses of prior patenting, prior invention, estoppel, etc., brought forward, for the first time, in this case, had they been duly presented for the consideration of that Court.

**THE PROCESS OF SPOT WELDING, SO-CALLED, OF HARMATTA IS BUT A NORMAL AND EXPECTED APPLICATION OF ELECTRIC RESISTANCE WELDING AND INVOLVES NOTHING PATENTABLE**

Any one who, at any time or place, fastened two pieces of metal together by electrically welding them to one another at a spot or spots only of their juxtaposed or opposite faces by the application of pressure and heating current, localized in such spots, practiced the essentials of the, so-called, Harmatta spot welding process.

Eliminating the idea of a welding at a spot or spots comprising less than the whole of the juxtaposed surfaces of the parts to be united, we have nothing but the original Thomson butt-welding process, so-called, of 1886; but, keeping in mind and applying that idea, we

find that the process was practiced long before Harmatta, by Thomson, by Lemp, by Robinson, by Kleinschmidt, by Burton, by Perry, by de Ferranti, by Parkinson, and by still others, whose prior dates are established by record evidence; and also by Rietzel and by McBerty, whose dates are fully and satisfactorily established by the testimony offered in this case.

(a) So far as the nature of the metal parts acted upon is concerned, it matters not of what metal they are composed—they may be of any metal, as suggested by Thomson in his patents Nos. 396,015 and 444,928, by Burton in his patent No. 647,694, and by Benardos in his patent No. 50,909, or of tinned iron as suggested specifically by Thomson in his patent No. 496,019, and by Harmatta in his French patent, 336,187, or of zinc-coated metal, as in Perry, 670,808.

(b) The parts to be united may be metal in sheets of uniform thickness, as suggested in Thomson, 396,015 and 444,928, in Burton, 647,694, and in Lemp, 553,923, or in very thin metal sheets, as suggested in Thomson, 496,019, and in Benardos, 50,909; or thin pieces may be united to thicker pieces as suggested in Robinson, 574,942, and in Kleinschmidt, 616,436. When plates are to be united they may be plane-faced, throughout, as in Thomson, 444,928, Lemp, 553,923, and Benardos, 50,909; or they may be provided with projections on both parts, as in Rietzel, 928,701, or with projections on one part only, as in Robinson, 574,942, Kleinschmidt, 616,436, and Rietzel, 928,701. Cylindrical wires may be the material operated upon, as in Perry, 670,808.

(c) The electrodes may be of any suitable material, that is to say, copper as suggested by Burton, 647,694, and Parkinson, 14,536, or of iron, as suggested by

Thomson 496,019, or of steel, iron or copper faced with hard carbon, as in Thomson 496,019, or of graphite, prepared carbon, mixture of clay with carbon, magnesium, iridium, carbon with thin metal coatings, as suggested by Benardos, 50,909.

(d) The form of the electrodes is immaterial. They may be rollers as in Thomson, 444,928; Lemp, 553,923; and as suggested in Harmatta's original specification and in his British and French patents; they may be pin-shaped, as in Benardos, 50,909; in Burton, 647,694; and as in Harmatta; or they may be flat, as in Rietzel, 928,701; Parkinson, 14,536; Robinson, 574,942; and Kleinschmidt, 616,436; or concaved, as in Perry, 670,808. They may be pin-shaped and pointed as in the Harmatta patent; Benardos, 50,909; and Thomson, 496,019 (Figs. 12 and 13), or of cylindrical form and not pointed as shown in the drawings furnished with the first alleged foreign machine imported into this country (Plaintiff's Exhibit No. 8, Drawings of Machine Bought by National Co. from Silesia Co. A B C) (Rec., p. 125).

(e) It is assumed that the current must be of low voltage and large quantity, and that it is to be adapted to the electrodes used and the character of the work to be operated upon. In his original specification Harmatta gives no specific directions as to current, and in his patent, as granted after attorney's amendment, it is stated:

(Page 2, column 2 of patent specification.)

"The time and duration of pressure and heating and the amount of pressure as well as the volume of current for effecting the weld can be readily determined by experiment for different thicknesses of metal and as well understood in the art of electric welding to which my invention relates."

While each individual worker in the art may have devised or invented some slight change or improvement in some particular part of the apparatus, the use of none of such special parts altered the essential nature of the process, as such practiced by their use for electric welding.

When, therefore, in the natural and normal development of the art of resistance welding, occasion arose to unite two flat plane-faced plates or parts of metal, at one or more spots instead of across the whole of their proximate faces, it was, we submit, but the adoption of a perfectly obvious expedient to employ relatively small electrodes for the purpose.

In proof of this, without either having knowledge of the work of any of the others, Thomson, in 1893; Rietzel, in 1897-8; Benardos, in 1889-90; McBerty, in 1901; and Harmatta, in 1903, each independently and, as we contend, without the exercise of a particle of patentable invention on his part, hit upon this *same* expedient.

The fact that many, operating absolutely independently, reach a result in the same way, has often been held to evidence a *lack* of invention.

Bromley Bros. Co. vs. Stewart, 51 Fed., 912-916;

Haslem vs. Pittsburgh Plate Glass Co., 68 Fed., 479-481;

National Tube Co. vs. Spang, 135 Fed., 22-29, Affd., 135 Fed., 351;

Elliott & Co. vs. Youngstown Car Mfg. Co., 181 Fed., 345-349;

Walker on Pats., 5th Ed., p. 27.

It is significant that neither of the early workers in the art referred to ever thought he had made an in-

vention when he first welded together metal plates in spots by means of pin electrodes as distinguished from electrodes of other forms, or ever thought of applying for a patent for either the process or product resulting from the use of such pin electrodes.

Harmatta himself, although he applied for patents all over the world (see his preliminary statement, Rec., p. 1846), never originally specifically claimed, in any country, the use of such electrodes (see his British application, Rec., p. 1124; his French application, Rec., p. 1146; his Canadian application, Rec., p. 2042; and his original U. S. application, Rec., p. 1361), although he did claim roller-electrodes specifically in all of those applications.

It is also significant that Harmatta never succeeded in getting a foreign patent, even on his machine, and of course, not on his alleged process or product, in any country where an examination for novelty was made, and where patents were not granted as a matter of course.

In his own country, Germany, where a careful examination for novelty is always made, a patent was refused his assignee, William Egel (who also took the French patent No. 336,187, Rec., p. 1144). See Harmatta's Oath, p. 1364; Harmatta's preliminary statement, p. 1846; and "Patentblatt," pp. 2086 and 2092. In Canada, where an examination is also made, a patent was likewise refused. And, as we have seen, a patent was consistently refused him, for over five years, in the United States, and it was only after novelty had been accorded Rietzel (in apparent ignorance on the part of the Patent Office Examiner of the prior work of Robinson, Burton, Bernardos and others) that the Patent Office, with evident reluctance, gave him a



patent. In this connection, it should be noted that the Examiner who finally passed his case, sought to shift the responsibility for so doing upon the Examiner who had previously acted upon it. (Rec., p. 1435.)

**THE ENORMOUS EXTENSION AND COMMERCIAL DEVELOPMENT OF THE ART OF ELECTRIC RESISTANCE WELDING, OR, SO-CALLED, SPOT WELDING, IS NOT ATTRIBUTABLE TO HARMATTA**

In the Barney & Berry suit, it was proven that the practical art of spot welding plane-faced plates or parts together was practiced, commercially, by others before it was practiced by Harmatta or by the Thomson Electric Welding Company, and before the last-named company knew of or had acquired any rights under Harmatta's U. S. application.

In his opinion Judge Dodge said (227 Fed., p. 432):

“Under its butt-welding patents and roller-welding patent the Thomson Company appears to have had a complete monopoly of electric welding. The latter patent expired January 20, 1908. While the monopoly continued, electric welding machines could only be had under lease from the Thomson Company, restricting their use to specified articles.

In 1908 the Toledo Electric Welder Company, which made the machine which the defendant uses, and is defending this suit, began to make and introduce machines for spot welding. Other concerns followed in 1908, 1910 and 1911, all acting without knowledge of previous applications by Harmatta or others for patents covering the spot-welding process. Upon these circumstances it can hardly be said that, upon the question of patentable novelty in anything invented by him, Har-

matta is supported by any advantages which the development of spot welding since 1908 has shown to reside in the process, or by any commercial success it has attained. I do not think the facts shown entitle him to say that by his alleged invention, as he was finally obliged to define and limit it, he was the first to supply a widespread demand not previously met."

In the present case, we have testimony to the same effect.

Mr. Rietzel testified as follows (Rietzel, Rec., p. 638):

"Q. 35. How early was the spot welding of plane plates not provided with projections on either of their meeting faces, an established practice in the art to your knowledge?

A. I don't believe I can give any definite time and date, but I think it was three or four years after, or more, than when I made the first specimens. In fact, I only can remember of doing some commercial work, I think it was in the year 1906. There may have been some previous to that time, but I can't recall now."

Mr. Clark, a witness for the plaintiff, testified as follows (Rec., p. 261):

"X-Q. 87. You don't know who got up the design for the first spot-welding machine that was constructed or used at the Lynn factory, do you, for the Thomson Electric Welding Company?

A. I do not; it was in Mr. Rietzel's time.

X-Q. 88. And it may have been him?

A. Possibly.

X-Q. 89. When Mr. Rietzel left the Thomson Electric Welding Co. he went to the Universal Electric Welding Company, did he not?

A. Yes.

X-Q. 90. That was some time in 1907, was it not?

A. I think about that year."

McBerty, for the defendant, testified as follows (Rec., p. 742):

"Q. 198. When, to your knowledge, was a spot-welding machine for welding flat plane-surfaced plates together by pressure and current applied to one or more electrodes, first put upon the market?

A. I would say that line of product was put upon the market along about 1908. It is rather difficult for me to say.

Q. 199. What machines first appeared on the market for doing this spot-welding, so-called, and who put them out?

A. The Winfield Company manufactured the first spot-welding machine that I knew.

Q. 200. When was that?

A. That was along about that time—1908."

Gravell, a witness for the plaintiff, testified as follows (Rec., p. 70):

Answer to X-Q. 32:

" \* \* \* The first time I came in contact with spot-welding as described by me was at the Hale & Kilburn Co., in 1910.

X-Q. 33. In 1910 was what you now call 'spot-welding,' arrived at empirically by you or did somebody communicate the idea to you?

A. While I was employed by the Hale & Kilburn Co. in the early part of January, 1910, they had already been using spot-welding for some little time.

\* \* \*  
X-Q. 35. Then it was from Hale & Kilburn that you first learned of spot-welding. Am I right about this?

A. That is right, but having been to the factory of the Hale & Kilburn Co. some months previous to my employment by them, I first saw spot-welding in their plant at that time."

Taylor, a witness for defendant, testified that Winfield spot-welders were sold and on the market as early as 1908 (Rec., p. 898, Q. 72).

It is not, therefore, to the invention of Harmatta, nor to the work of his assignee, the Thomson Electric Welding Company, plaintiff's predecessor, that the successful introduction and great commercial success of spot-welding, so-called, is attributable.

If Harmatta and his work had never been known in this country that development would have taken place, just the same, and, once started, could not have been stopped, any more than it can now be stopped.

With the growing scarcity of wood, the urgent demand for the use of sheet metal as a fire protection, the general availability of electric current, the expiration of the basic, dominant Thomson electric welding patents, and the appearance on the market, concurrently with these conditions, of numerous modern, up-to-date, scientifically constructed resistance welding machines, adapted especially to the convenient and expeditious welding of thin metal plates and of all sorts, kinds and shapes of small metal parts where great strength of union is not required, spot-welding, so-called, has grown apace (McBerty, Rec., p. 744; Thomson, Rec., pp. 543-544). It was not, however, until after the Harmatta patent had been sustained by the Court of Appeals that the Thomson Electric Welding Company, and later its successor, the plaintiff (composed now mainly of lawyers, Rec., p. 816) got into the field, to any appreciable extent, and using, speculatively, the

adjudication of the patent, as a club, undertook to hold up the entire commercial world and make all users of spot-welding machines pay enormous tribute, amounting now to \$250 per year, for each machine.

The vigorous defense of this suit is a protest against such conduct.

There is one other thing that should be mentioned in this connection.

In the present suit, testimony has been offered by the plaintiff, tending to show that two spot-welding machines provided with pin electrodes were imported into this country from Berlin, Germany, in the forepart of the year 1905, by the National Enameling & Stamping Company, and installed at the latter's factory, at Baltimore, Md., where they have been in use ever since (Knapp, Rec., p. 124; Herring, *Ibid.*, p. 130; Knapp, *Ibid.*, p. 217; Knapp, Jr., *Ibid.*, p. 230; Herring, *Ibid.*, p. 229). These machines, though not strictly proven to have emanated from Harmatta, were said to have been procured from a German concern that purported to control Harmatta's German rights. Further evidence was offered by the plaintiff tending to show that the National Enameling & Stamping Co., using these two machines as models, caused fifteen other machines like them to be made, for its own use, and that they were so used at its different factories, all in the year 1907 (Knapp, Jr., *Ibid.*, p. 232).

Why this evidence was not availed of in the Barney-Berry suit has not been explained.

That the plaintiff knew of the existence of the machines and of their use by the National Enameling & Stamping Company is established by the fact that, on November 17, 1910, over two years before the Barney-Berry suit was instituted, the Thomson Electric Weld-

ing Company (as owner) and the Universal Electric Welding Company (as licensee) brought suit on the Rietzel patent, No. 928,701, charging the use of those very machines by the National Enameling & Stamping Company to be an infringement of the said Rietzel patent (Rec., p. 1986; Knapp, p. 227, *et seq.*), which suit was subsequently discontinued on the defendant taking a license from the plaintiff (Knapp, Rec., p. 229).

The plaintiff may have thought that the disclosure of the existence and use of these machines, in this country, as early as 1905 would show a public use for profit more than two years prior to the making of either the process or product claims of the Harmatta patent, and thus raise an uncomfortable bar, difficult to handle; but, whatever the plaintiff's motive may have been, the fact remains that the introduction of the machines from abroad and their duplication, subsequently, does not enable the plaintiff in this case to truthfully say that the great commercial extension of resistance or spot-welding was attributable, directly or indirectly, to the work of Harmatta, or his assignees. The use by the National Enameling & Stamping Company appears to have been confined to its own factories.

#### SPOT WELDING BY McBERTY IN 1901

It appears that, in the early days, every one who first began to use an electric resistance welding machine for the, so-called, butt-welding of metal bars or plates, end to end, sooner or later, and naturally, drifted into its use for the welding of plates or bars, flatwise, face to face. The use, for one purpose, seems to have suggested the other. Each operator appar-

ently reasoned that if he could weld the ends of plates together, he could also weld their side faces, or as much of such faces as he desired, together.

Thomson, Lemp, Rietzel, Robinson, Kleinschmidt, Burton, Benardos, and others all caught this idea and proceeded, by the use of slightly differing forms of apparatus, to apply it. Another to do the same thing was Mr. Fred P. McBerty, of Warren, Ohio.

The history of his work occupies a considerable portion of the record. There can be no doubt whatever that he repeatedly spot welded according to the, so-called, Harmatta process, as early as 1901,—before the earliest work of Harmatta—and the principal controversy, as to him, has been as to the *amount* of work that he did at that time. We may say, however, in passing, that if he practiced the invention, at all, even in a single instance, and disclosed it to others so that they could and did also practice it, he, under the authorities, completely anticipated Harmatta.

Egbert vs. Lipman, 104 U. S. 333;

Coffin vs. Ogden, 18 Wall. 120;

Brush vs. Condit, 132 U. S. 39;

U. S. Mineral Wool Co. vs. Manville Covering Co., 125 Fed. 770.

Mr. McBerty was, at the critical period, a mechanical engineer and little versed in the science of electricity. From 1898 until 1902 he was the superintendent of the plant of the Warren Electric & Specialty Company, of Warren, Ohio, a concern that manufactured and sold incandescent lamps, transformers, desk fans and ceiling motor fans. Up to 1901, the Company made desk fans in which the spiders, the fan blades and guard wires were all composed of brass,

the blades,—four in number,—of each fan being connected to a corresponding number of arms of the fan spider by means of rivets, applied in the usual manner. The guard wires of these fans were secured at their abutting ends in a variety of ways, as, for example, by slipping a metal sleeve over both ends of the wires and soldering the parts in position; or by milling or reducing the ends of the wires and lapping them, and then pinning them together, completing the joint by solder; or by drilling a hole in the end of each wire, slipping a pin in the holes thus formed, to hold the ends in alignment, and then soldering the joints. Fans of this description are shown in the 1900 Catalogue issued by the company of which a copy is in evidence (See Defendant's Exhibit No. 1, 1900 Catalogue of the Warren Electric & Specialty Company," offered Rec., p. 674.)

In the latter part of 1900, the Company concluded to add to its output a cheap grade of fan which should sell for a price less than that charged for its other fans, and it was determined that these cheap fans should have the fan blades, spiders and guards constructed of steel. Mr. McBerty had read some descriptions of the construction and operation of Thomson butt welders, and, supplementing this knowledge with information derived from Mr. Edward B. Craft, an electrical engineer employed by the Company, he designed and had built an electric welding machine, with a view, primarily, to butt-welding together the ends of the steel guard wires that were to enter into the construction of the new fans. This welding machine was the first that had ever been installed at the factory and, in fact, the first one that Mr. McBerty had ever actually seen. It fulfilled its original pur-



pose admirably. The witnesses on both sides agree that steel guard wires were successfully welded by means of it in 1901 (McBerty, Rec., p. 715, *et seq.*). Little, Rec., p. 311; Spade, *Ibid.*, p. 314; L. C. Brewer, *Ibid.*, p. 271, *et seq.*; C. R. Brewer, *Ibid.*, p. 285; Wolfe, *Ibid.*, p. 249.

With this, to him, perfectly novel electric welding apparatus to play with, it was inevitable that, sooner or later, Mr. McBerty should, like previous users of butt-welders, come to the welding of metal plates, face to face. As a matter of fact, after accidentally discovering that he could weld pieces of sheet steel scrap together, it occurred to him that he could weld his steel fan blades to his steel spider arms by applying pressure and current to them, at spots, and thus form a union that would answer the purpose of rivets. Just how this came about is best told in his own language (Rec., p. 716):

“Q. 45. And after you had successfully welded the ends of the guard wires on this steel-bladed fan, how came you to arrive at the conclusion you could also weld the fan blades and spiders?

A. That was the result of an effort on my part to electrically weld copper wire of a reasonable cross section, approximately the same cross section as the guard wires.

Q. 47. You mean to butt weld them?

A. Yes, sir.

Q. 48. You may go on with your illustration.

A. When I tried this operation, I was not successful in making a weld; I did not seem to get the heat necessary to fuse the projecting ends. This led me to believe I did not have sufficient resistance at the point of contact between the abutting ends of the copper wire, but I did know that this

resistance was generated by heat on the iron wires; to get, therefore, practically the same effect on the two copper wires, as I did get on the two iron wires, I put pieces of sheet steel, small pieces of sheet steel, between the abutting ends of the copper wire; the copper wires were clamped in position in the jaws; small pieces of steel placed between the abutting ends, pressure applied; with the aid of the lower clamp to move the swinging plates toward each other, and turn on the current, and while I generated heat, apparently lots of it, I did not weld my copper wires, *but I did weld my two steel plates.*

Q. 49. How did you expect to weld the two copper wires with the steel plates interposed between them?

A. My impression was that the resistance of the the steel plates would generate sufficient heat which would be communicated to the copper wires to bring them up to the fusing point, and the pressure applied would force out the steel plates which would melt up, and I would have a weld.

Q. 50. You mean you expected the copper wires would pass through the steel plate after a proper degree of heat?

A. Yes, sir; after a proper degree of heat, or they would burn up or melt out the steel plates.

Q. 51. So that the ends of the copper wires would come in contact?

A. Yes, sir; the ends of the copper wires would come in contact.

Q. 52. And be sufficiently heated to weld?

A. Yes, sir.

Q. 53. Tell us again what the result of that trial was.

A. The steel plates came up to a welding heat on their two meeting surfaces, but my copper electrodes did not come up to a welding heat, when I cut the current off. Since that experiment was not successful, I found I had made a perfect weld between the two steel plates.

Q. 54. Now, how did you utilize that discovery, if at all?

A. After repeated experiments, or repeated demonstrations, of the process to enable me to get a good idea of the strength of a union of that kind, it appeared to me that could be used to replace or to take the place of the rivets in the steel blade guards or centers.”\*

Following up this discovery as to what could be done in the way of uniting two plates, face to face, by his electric welder, Mr. McBerty proceeded to slightly modify his machine so as to conveniently weld the steel fan blades of his new fan to the steel spiders or centers. This modification consisted in inserting and holding in the clamps originally designed to hold the ends of the steel guard wires, a pair of co-operating copper electrodes, and, by first clamping the fan blades and spider arms to be united between these electrodes and then turning on the current, a weld was made at the point of application, answering the purpose of a rivet (Rec., pp. 717 and 721). The number of welds formed was, of course, determined by the number of applications of pressure and current to the work, through the instrumentality of the electrodes, in the manner described.

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\*It is a curious coincidence that what Mr. McBerty tried to do, i. e., burn through steel plates so as to bring the copper electrodes together, but did not succeed in doing, Mr. Gravell, plaintiff's expert witness, succeeded, though inadvertently, in doing, in admirable fashion, at the test made by him at Detroit in the presence of his Honor, Judge Killits. Mr. Gravell on that occasion walked up to a perfectly new, modern, up-to-date spot welding machine, and, placing two large, clean, superposed steel plates between the electrodes, applied to the plates pressure and current long enough to burn a hole clear through the plates (see "Plaintiff's Exhibit 26, Large Sample of Spot Welding," Rec., p. 268), so that the electrodes came in contact with each other! Mr. McBerty apparently had not sufficient current, while Mr. Gravell used too much.

When Mr. McBerty had demonstrated the feasibility of uniting the fan blades of this cheap fan to the spider arms, by welding, his project was so well thought of that he made up fifteen or sixteen fans in this way, put them through the usual tests, common to other fans, and they were then disposed of as a part of the regular output of the factory. Furthermore, in getting up the Company's catalogue for the season of 1901, a cut was made of this cheap fan and the same was designated as the G-2 fan and referred to as an "ironclad" fan. When, however, it came to discussing the subjects of actually putting out this cheap fan, in quantities, it was decided that the former practice of riveting the fan blades to the spiders should be continued, first, because the Company had all the appliances for punching the rivet holes in the parts and for applying the rivets; secondly, because the workmen were familiar with such old methods of attachment; thirdly, because more welders and jigs would have to be built if welding were adopted, one welder not being sufficient to do all the work required; fourthly, because it would involve the carrying of double stock, namely, blades and centers adapted for riveting and other blades and centers adapted for welding. Another consideration that probably had some weight with Mr. Gilmer, the General Manager, was that the broad generic art patent of Thomson was still in force and covered all applications of resistance welding and to continue to spot-weld the fan blades would be to invite a law suit. Notwithstanding the very limited quantity of spot welded fans that were put out during the season of 1901, they were not only advertised and shown in the Company's catalogue of 1901, as "Ironclad" G-2 fans, but were likewise advertised, as thus

shown, in a trade journal, called the "American Electrician," in the issue of April, 1901, page 163 (Rec., p. 772), and continued to occupy a place in the advertised output of the Company contained in the Company's catalogue for 1902 (Rec., p. 728).

Quite a number of reliable witnesses testify to the building of the welder in 1901 and to its use during that year, both for the *butt welding* of the steel guard wires of the G-2 fans, and for the *spot welding* of the fan blades to the spiders. We give below brief references to the testimony of these witnesses.

### Fred P. McBerty

Mr. McBerty testifies in detail to the construction of the welder and its use for butt welding (Rec., p. 715), also to the modification of the machine for spot welding and to the manner in which spot welding of the fan blades to the spiders took place (*Ibid.*, p. 717, *et seq.*). He says the spot welded fan blades were tested and found to be satisfactorily united to their spider arms, and he gives the details as to the manner in which the welds were tested (*Ibid.*, p. 723). He tells us that the spot welding of the blades was regarded as a realization of the directions given him to produce a cheap fan (*Ibid.*, p. 724). He tells of the making of the cuts of the spot welded fan for the 1901 Catalogue (*Ibid.*, p. 724). He points out that, whereas all of the other fans shown in the 1901 Catalogue disclose the fact that the blades are riveted, the cut of the G-2 fan shows no rivets (*Ibid.*, p. 725). He says that fifteen or sixteen of the G-2 fans were shipped out and disposed of as regular product (*Ibid.*, p. 726). He explains in detail the discussion between himself, Mr. D. W. Gilmer, the general manager, and Mr. Jasper

Powers, and the arguments advanced why the ordinary method of riveting should not be displaced by spot welding, as follows (*Ibid.*, p. 727):

“Q. 107. Why, if you know, were not more of this type of fan with the spot-welded blades and spiders put out?

A. That was a matter that was discussed between D. W. Gilmer, the general manager of the Warren Electric & Specialty Company; Mr. Jasper Powers, the production man, or machine shop superintendent, of the Warren Electric & Specialty Company; and myself. We had to get out a certain number of fans in a given time. We got our sample fan completed, and the matter of spot welding the blades was taken up with Mr. Gilmer and with Mr. Powers, Powers being the mechanical man, having in charge the production of the metal parts of the fan, and he rather insisted that we stick to the older method of riveting, due to the fact that he had the punches made for punching his centers, and punching his blades. He had operators skilled in putting these blades in position, and could go through all the regular processes without any interference at all, it was standard, whereas, if they had to be spot welded, it meant an electric welding machine with capacity enough to take care of our current for welding both the blades and spiders and required considerable time, particularly if we got what we call a hot season, and be compelled to produce a lot of fans, and again, he would have to purchase jigs for holding the blades in position, and also another welding machine, to give us capacity to take care of the product. All those would involve an outlay of considerable money, which was quite an object with us, and the delay, due to the production of the additional machine, jigs, and furthermore, it would compel us to carry a line of fan blades which were punched ready for the

brass rivets, a line of centers already punched, and a line of blades not punched, and a line of centers not punched, thus compelling us to carry duplicate stock, which we always avoid if we can. The final result was they overruled my spot-welding idea, sticking to the riveting for that season, with the definite understanding if anybody wanted spot-welded blades we would be in a position to weld them."

He explains the perpetuation of the cut of the G-2 fan in the catalogue of 1902, and that the G-2 fan of that catalogue is the only one which does not show the blades riveted to the spider arms (*Ibid.*, p. 728). He points out, further, that the guard rings of the G-2 fans illustrated in the 1902 Catalogue show no joint, thus indicating that they were electrically welded (*Ibid.*, p. 729). He explains that the 1903 and 1904 catalogues issued by the Peerless Electric Company—that succeeded to the fan business of the Warren Electric & Specialty Company—omit the illustration of the G-2 fan shown in the 1901 and 1902 catalogues, indicating that all of the fans put out during those years had the blades riveted (*Ibid.*, p. 730). He explains the diligent efforts that he has made to recover one of the spot welded G-2 fans put out in 1901, showing that most careful investigation had been made through searchers sent to different parts of the country and through elaborate schemes of advertising (*Ibid.*, p. 731). He states where the transformer was obtained that was used in connection with the welder, and names a number of witnesses who were familiar with his spot welding practice in 1901, including in the list, Captain William E. Smith, Mr. McDonold, the motor tester, and Mr. E. B. Craft, the electrical engineer, now connected with the Western Electric Company (*Ibid.*, p. 732).

He says that Jasper Powers was the man who built the welding machine under his direction (*Ibid.*, p. 732). He produces a specimen of work done by him in 1901, consisting of a spider arm and fan blade spot welded together, the same being marked "Defendant's Exhibit M" (*Ibid.*, p. 737). This was one of the first satisfactory specimens of spot welding that he made (*Ibid.*, p. 735). It bears a date mark, "2-15-01," which he says means Feb. 15, 1901, and was applied by him to the specimen on that date (*Ibid.*, p. 736). It also bears the impression of a stamp reading "F. McBerty," which he says was applied at the same time (*Ibid.*, p. 737). The stamp itself is offered in evidence as "Defendant's Exhibit L" (*Ibid.*, p. 737). He says this specimen "Exhibit M" originally formed part of a center or spider having two spot welded blades attached, and that when his company, the National Electric Welder Company, was threatened with suit under the Harmatta and Rietzel patents in December, 1912, he cut the center in two, retaining the part which now constitutes "Exhibit M" and sending the other part embracing a part of the center and one blade spot-welded thereto, to his attorney, J. Nota McGill, of Washington, D. C., (*Ibid.*, p. 739). He produces a letter dated January 29, 1913, in which Mr. McGill asks him to send him one of the fan blades which was spot welded in 1901 (*Ibid.*, p. 756), and a copy of his letter in reply, dated February 1, 1913, announcing the sending of the fan blade to Mr. McGill, by parcels post (*Ibid.*, p. 756). He also produces a letter from Mr. McGill, dated February 3, 1913, acknowledging receipt of the fan blade (*Ibid.*, p. 757), and another letter from Mr. McGill to the National Electric Welder Company, dated Sept. 2, 1913, stating that he was turning over



the fan blade to Mr. Edwards, the attorney for the Toledo Electric Welder Company, who was conducting defense of the Barney-Berry suit (*Ibid.*, p. 762), also a letter from Mr. McBerty to Edwards, Sager & Wooster, dated January 20, 1917, calling for the return of the fan blades (*Ibid.*, p. 757), and the reply of Messrs. Edwards, Sager & Wooster, acknowledging the receipt of the letter last referred to and stating that the sample blade had been turned over to and had become the property of the plaintiff, the Thomson Spot Welder Company (*Ibid.*, p. 758).

He produced the original welding machine (Defendant's Exhibit B), built in 1901, and explained what parts of it are originals and what reproductions (*Ibid.*, p. 767, *et seq.*, p. 817, *et seq.*) He operated the machine in the presence of His Honor, Judge Killits, at the defendant's plant, in Detroit, producing with it (1) Defendant's Exhibit No. 56, consisting of a complete set of steel fan blades, spot-welded to a steel spider or center; (2) Defendant's Exhibit No. 57, consisting of two steel plates one-sixteenth of an inch thick, spot-welded together at a number of places, constituting a succession of welds, beginning near the middle of the sheets and extending to the edge and then extending inwardly again to the opposite edge (*Ibid.*, p. 769); and (3) another specimen, marked Defendant's Exhibit No. 58, consisting of two plates of one-eighth inch steel stock one and one-half inches wide, spot-welded together in three places (*Ibid.*, p. 769).

He also, with the same machine, produced a number of samples of butt-welded wires, marked, respectively, Defendant's Exhibits Nos. 59, 60 and 61.

During the examination of Mr. McBerty, it was developed that, in the year 1911, the National Electric

Welder Company, of which he was an officer and part owner, was organized to manufacture electric welding machines for both butt and spot welding. Other companies, such as the Winfield Electric Welding Company and the Toledo Electric Welding Co., were at that time engaged in the manufacture and sale of the same kind of machines. After the National Company got started, it was notified by the Thomson Electric Welding Co., the predecessor of the plaintiff, that in the putting out of spot-welding machines, it was infringing upon the Rietzel patent owned by the Thomson Company and also upon the Harmatta patent (Rec., pp. 738 and 745).

The Rietzel patent had been issued on July 20, 1909; the Harmatta patent on December 3, 1912, both to the Thomson Company. The formal notice of infringement was received some time in December, 1912; but, before that time, having learned that the Thomson Company had brought suit against other users of spot-welding machines, under the Rietzel patent, Mr. McBerty had consulted with Mr. J. Nota McGill, of Washington, D. C., his patent counsel, as to how his company could best get protection against the claims of the Thomson Company by reason of his prior work in 1901.

Mr. McBerty showed Mr. McGill the specimen of spot-welding produced by him in 1901 and the welding machine by which the work was done at that time, and the question was canvassed as to how safe it would be to submit the original specimen to the Thomson Company if negotiations looking to immunity from suit were opened up with the Thomson Company (*Ibid.*, p. 739); and the suggestion was made by Mr. McGill that the specimen should be cut in two and a part only used in the negotiations, the identified part

or section (Defendant's Exhibit M, bearing the date 15-2-01) being retained in Mr. McBerty's custody (*Ibid.*, p. 739). This interview with Mr. McGill occurred at Warren, Ohio. Mr. McGill did not take away any part of the specimen with him at that time, but, having meantime arranged for a meeting with Mr. F. P. Fish, counsel for the Thomson Company, he on January 29, 1913, wrote to the National Company to send him a specimen of the welding, saying (*Ibid.*, p. 931):

"I have asked Mr. Fish to designate some day next week when I may see him in New York.

Please send me one of the fan blades which was spot-welded in 1901, or thereabouts. I mean one of the two which Mr. McBerty showed me when last in Warren. Let him mark it in some way so that he can hereafter identify it when returned."

To this letter, the National Company, through its assistant secretary, replied, under date of February 1, 1913 (*Ibid.*, p. 756):

"Re your letter of January 29, 1913. We forwarded you today, by parcel post (registered) the fan blade which was spot-welded in 1901 or thereabouts.

We could not give this more prompt attention due to the fact that Mr. McBerty was out of the city, and the writer could not get into the box in which he keeps his valuables."

The specimen blade that was thus forwarded, Mr. McBerty says was stamped by him, before forwarding, in accordance with Mr. McGill's suggestion, with the same private stamp punch "F. McBerty" that had been previously used to stamp Exhibit M (*Ibid.*, pp. 763-764).

The receipt of the blade was acknowledged by Mr. McGill in a letter dated February 3, 1913, which says (*Ibid.*, p. 757):

"I have your letter of the 1st instant and also the blade welded in 1901. Mr. Fish advises me that he may be able to make an appointment for some day next week."

Mr. McBerty says an interview at Boston with Mr. Fish and others connected with the Thomson Company, was arranged at which he (McBerty) was present and that, on that occasion, he showed Mr. Fish the other cut-off portion of Exhibit M, though he did not leave it with him.

Mr. McBerty further says that after hearing his story, Mr. Fish told him he thought his early work only amounted to an abandoned experiment, and that he (McBerty) then returned the sample to Mr. McGill, who later turned it over to Mr. Edwards, the attorney for the Toledo Electric Co. That the specimen blade was turned over to Mr. Edwards is shown by a letter from Mr. McGill to the National Co., dated September 5, 1913, which says (*Ibid.*, p. 762):

"I have had an extended interview with Mr. Edwards, the attorney for the Toledo Company, and have turned over to him the several notes of introduction of use witnesses and copies of their affidavits and the specimen fan blade."

Receipt of this fan blade was acknowledged by Mr. Edwards in a letter to Mr. McBerty, dated September 20, 1913, stating (*Ibid.*, p. 763):

"We have received from Mr. McGill the *data* regarding the early use of spot-welding by the

Warren Company. We would like to send Mr. Howe, of this office, to interview yourself and the other witnesses of this use in order to put the matter in the shape of affidavits, and also to investigate any collateral evidence that might be developed in order to corroborate the various witnesses.”\*

Mr. McBerty testifies that in January, 1917, before the commencement of this suit, he wrote Mr. Edwards for the return of the sample fan blade, to which letter he received a reply reading as follows (*Ibid.*, p. 758):

“Dear Sir:

“Replying to your letter of inquiry regarding the sample of fan blade and affidavit, we beg to say that we examined this matter very carefully at the time it was presented and did not press the point of the exclusion of the evidence by Judge Dodge because, in our opinion, it would have been ineffective against the Harmatta patent. We considered that it would have been regarded by the court as an abandoned experiment. We understand that the National Electric Welding Company, as well as practically all other makers of welding machinery in the United States, is now licensed under the Harmatta patent, and, in view of the fact that the preparation of the affidavit was entirely paid for by the Toledo Company, and in view of the fact that the assets of the To-

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\*Among these data Mr. Edwards, when called by the plaintiff, admits was the sample fan blade delivered to him by Mr. McGill (*Rec.*, p. 291).

Mr. Howe, plaintiff's witness, does not say that any of the samples annexed to the McBerty affidavit produced by him is the sample fan blade left with Mr. Edwards by Mr. McGill, nor that any of those samples were turned over to him by Mr. Edwards. Mr. McBerty, however, testifies positively that the sample delivered by him to Mr. McGill is not among the samples annexed to the affidavit (*Rec.*, p. 886, Re-D. Q. 1209). The conclusion to be drawn, therefore, is that the missing sample which fits the sample of blade and center (Exhibit M) produced in evidence by Mr. McBerty, is still in plaintiff's possession and has been withheld. (*Ibid.*, p. 758.)

ledo Company have been transferred to the Thomson Spot Welder Company, the affidavit and sample are now the property of the Thomson Spot Welder Company and cannot be delivered without an order from that company. Will you, therefore, take the matter up directly with the Thomson Company?

Yours very truly,

EDWARDS, SAGER & RICHMOND."

From all this evidence it is clear that the missing mating-piece that was cut from Exhibit M is still in the possession of the plaintiff, and that its production in evidence has probably been withheld because of the corroboration it would afford of Mr. McBerty's story in regard to the matter.

#### Major Edward B. Craft

Major Craft is an electrical engineer. At the time of giving his testimony in this case he was assistant chief engineer of the Western Electric Company, in New York City, with about two thousand (2,000) engineers under him (Rec., p. 773), and had recently returned from war work abroad in the Radio Department of the United States Navy, having been over there on the staff of Admiral Sims.

He was employed by the Warren Electric & Specialty Company, at Warren, off and on, between 1898 and until the first of 1902 (*Ibid.*, p. 774). He went with the Western Electric Company, January 6, 1902, and has been with that company ever since.

He testifies that he got his first experience in electric welding at a visit made to the works of the Pneumatic Wheel Company, Freehold, New Jersey, which Company had purchased of the Warren Electric & Specialty Co., a welding transformer (*Ibid.*, p. 774). Says

that in the latter part of 1900, when the Warren Company was considering the development of a cheap fan with parts of steel instead of brass, the conclusion was reached by him and McBerty of the possibility of utilizing electric welding in the production of the new fan. Accordingly, a rather crude welder was built adapted primarily to the butt-welding of the ends of the steel guard wires of the fan. This welder worked successfully for that purpose (p. 775). He says Mr. McBerty at that time also spot welded some of the steel fan blades of that fan to the steel spiders. He did not actually see Mr. McBerty do this spot welding work, though he remembers that McBerty showed him some of the spot welded fans and satisfactorily demonstrated the strength of the union between fan blades and spiders to him (p. 775). He saw incomplete and wholly completed fans with spot welded blades at that time (p. 775) and saw the fans in operation, running (p. 790). The spot welds served the place of rivets (p. 776). The steel spiders employed were of regular stock and perforated, but the blades welded to them were unperforated (p. 776). For the spot welding of the fan blades pointed copper electrodes were provided (p. 777). He saw the McBerty machine when demonstrated to Judge Killits at the Ford plant and identified it (p. 777). The spot welded work done on this occasion was similar to that seen by him in 1901 (p. 778). He doesn't remember the exact number of completed spot welded fans that he saw at Warren in 1901, but thinks there were at least half a dozen (p. 780). Some of the spot welded fans that he saw were ready to ship (p. 790).

He remembers personally trying to weld fan guards, but doesn't recall trying to weld anything else (p. 792).

The testimony of Major Craft is important because of his standing and his entire disinterestedness.

### Jasper W. Powers

Mr. Powers is now in charge of tools and production at the great machine shop of the Babcock & Wilcox Company, at Barberton, Ohio. (Rec., p. 873.)

He was engaged as a machinist and toolmaker at the works of the Warren Electric & Specialty Company between 1898 and some time in 1902, when he went with the Peerless Electric Company and worked in the same capacity till May, 1903 (p. 873).

While with the Warren Electric & Specialty Co., he, under the instruction of Mr. McBerty, built an electric welder for the welding of the iron guards of a cheap fan they were then getting up. This was in the early months of 1901 (p. 874). He identifies the welder, Defendant's Exhibit B, McBerty Machine, and points out parts he remembers working on (p. 874); says he himself operated the welder and welded on it a set of rings which he sent to his brother, who was a magician "doing magic work" at the Pan-American Exposition, at Buffalo, in 1901; that he filed up this set of rings and had them nickel-plated for use at the Exposition (p. 875).

He sent the rings to his brother in April or May, 1901, and himself attended the exposition in July, 1901. He remembers his brother saying, when about to give a performance, "Gentlemen, you will closely observe these rings are not made in a blacksmith shop; these are electric welded" (p. 875).

He testifies he also saw spot welding done on the McBerty welding machine (p. 875). He doesn't recall seeing completed spot welded fans, but remembers



seeing pieces of fan blade stock and pieces of transformer iron spot-welded together and that the welds were good and strong and could not be broken (p. 876). The welds served the place of rivets (p. 876).

Mr. Powers gives his recollection of the reason why spot welding was not generally adopted for the production of the cheap fans, as follows (p. 877):

“Q. 52. Do you know why the spot welding was not adopted as a general manufacturing proposition for this cheap fan?

A. Not entirely, no.

Q. Tell the Court what, if anything, you know about that.

A. Your honor, I had built up and made a complete line of tools for riveting blades, for riveting spiders, and the men were trained for doing the work in that way; and while I was responsible for the production, for whatever fans we built, that is, the mechanical work on whatever fans were built, I rather argued in favor of continuing the riveting. The season was coming on, as I remember, and we had everything required to continue the manufacture of fans, or proceed with the manufacture of fans, by riveting.

Q. 54. You mean that you argued; with whom did you argue about that?

A. Our manager, Mr. Gillmer, and Mr. McBerty, who, as I remember, rather favored, did favor, welding of the iron blades to the spiders.

Q. 55. Then, at that time Mr. McBerty spot welded the blades to the spiders, you and Mr. Gillmer and Mr. McBerty discussed its regular manufacture by the company?

A. Yes, sir.

Q. 56. And you objected to it for the reasons you stated?

A. Yes, sir.

Q. 57. And they favored it?

A. Well, Mr. Gillmer did, and we proceeded to make them that way, by riveting.

Q. 58. How were the rivets headed up, at that time, by hand or machine.

A. They were what we called hand riveted."

Mr. Powers says the only spot welding machine he ever saw was that made and used by Mr. McBerty in 1901 (p. 878). On his recall (*Ibid.*, p. 982) Mr. Powers says he made the electrodes that were used by Mr. McBerty for spot welding; that they were of hard drawn copper wire and had pointed or conical ends, and that they were made before the conference between Mr. McBerty, Mr. Gillmer, and himself, when the subject of using spot welding as a manufacturing process, for the season, was discussed (p. 982).

### John S. Gilder

Mr. Gilder went to work for the Warren Electric & Specialty Company in 1900, and worked in the fan department (Rec., p. 902). He says that at that time the fan blades put out by the company were made of brass and the spiders of bronze; that in 1901 pressed steel blades, iron spiders and steel guards were employed in the construction of cheap fans known as G<sup>1</sup> and G<sup>2</sup> fans (pp. 902-903). The fan guards or rings of these fans were welded by an electric welding machine, which he himself at times operated (p. 903). He identifies the machine, Defendant's Exhibit B, as the one used by him in 1901 (p. 903). Says he saw some fan blades for this cheap steel bladed fan that had been electrically welded to their hubs or spiders. Does not know how many, but a tray full containing eight or ten or a dozen. Examined these fan blades and saw they were spot welded;

the welds taking the place of rivets (p. 904). He didn't see any one do the spot welding. The advent of the electric welder caused a good deal of talk among the shop hands. This welding of the fan blades was done the first year the cheap steel fans were made (p. 905).

### Evrah C. Lipps

Mr. Lipps is at present foreman of the tool room of the Packard Motor Car Company, at Detroit, Michigan (Rec., p. 916). He was employed by the Warren Electric & Specialty Company, in 1900 and 1901, leaving such employment in June, 1901 (p. 916). He remembers an electric welding machine that was used in the Warren Company's shops in 1901. He occasionally used it himself to butt-weld rings together, though that was not his regular duty (p. 916). He remembers that other things were welded on the welding machine (p. 916). Knows that steel fan blades were welded to the center member (p. 917). He doesn't recollect seeing the actual welding of these fan blades, but recalls seeing them after they were welded (p. 917). On being shown the old welder he identified it as the machine he saw in the factory of the Warren Electric & Specialty Manufacturing Company, before he left there in June, 1901 (p. 917).

The fan blades that he saw were completed fan blades (p. 917). He assisted in making the welder (p. 918). Others who participated in that work were Mr. McBerty and Jasper Powers (p. 918). He remembers that Mr. E. B. Craft was at the factory of the Warren Company while he was there (p. 924). He recalls that bent electrodes were at one time used in the machine (p. 923).\*

\*NOTE: To this day bent electrodes are sometimes used for spot welding where the work cannot well be passed between the electrode holders. (See Electric Welding, by Hamilton and Oldberg, p. 103.)

On cross-examination, Mr. Lipps was shown an affidavit executed by him in 1913, for use in the Barney-Berry suit, and he testified that the facts set forth in that affidavit were true, according to his recollection at the time the affidavit was made. The affidavit will be found printed in full in the record (Rec., p. 450).

Mr. Lipps was forty-five years old when he made the affidavit and fifty-one when he gave his testimony in this case. Attached to his affidavit and marked "Exhibit "H" are two thin metal plates or sheets that were spot welded together by him in 1901. He had not seen these plates since he gave his affidavit, but was able to identify them (Rec., p. 922). Up to the time of giving the affidavit this spot-welded work had remained continuously in his possession (Rec., p. 453).

In the affidavit, he said that in 1901, at the factory of the Warren Electric & Specialty Company, he saw steel fan blades welded to the steel hub arms in a number of distinct spots and saw others that had been previously so welded. He also said that, so far as he knew, the spot welding of fan blades to the centers was not adopted commercially (Rec., p. 454). In his affidavit, Mr. Lipps refers to the affidavit of Mr. Frank G. Brown (*Ibid.*, p. 478) and to the specimen of spot-welded work attached thereto, marked "Exhibit B," consisting of a fan blade spot-welded to a spider arm and identifies that specimen as identical with what he saw in 1901, if it is not indeed one of the very things he saw (*Ibid.*, p. 454). The Court is asked to read the whole of the Lipps affidavit and also that of Frank G. Brown (*Ibid.*, p. 478). Brown, being dead, could not be examined.

John A. McDonald

Mr. McDonald is at present employed by the Trumbull Public Service Company, at Warren, Ohio, in

electrical construction work (Rec., p. 878). He testifies that from 1898 to 1911 he worked first for the Warren Electric & Specialty Company and then for the Peerless Electric Company.

When he went with the Warren Electric & Specialty Company, all the fan blades and spiders put out by the company were made of brass (p. 879). At first the centers or spiders were provided with three rivets; afterwards with two rivets (p. 879). The fans were, at first, made all of brass and then, for the construction of a cheap fan, they were made of steel (p. 879). The guards of the cheap fans were made of iron and their ends were welded together in an electric welding machine (p. 879). He saw some of this work done and did some himself (p. 880).

First saw the welding machine in the early spring of 1901—February or March (p. 880).

The cheap fan was known as the G<sup>2</sup> fan—G<sup>2</sup> and G<sup>1</sup> (p. 879). He was shown and identified the company's catalogue for 1901 (p. 881). He saw Mr. McBerty spot weld a set of fan blades complete (pp. 880-881). He tested the spot-welded fans (p. 881). There were about a dozen of them (p. 881). He describes the process of testing (p. 881). Says he used one of the spot-welded fans as a test blade for some time (p. 882). The spot welds on the fans served the place of rivets (p. 882). All of the fans survived the test. In none did the blades come loose and none came back after inspection by him (p. 882). Was shown the McBerty machine and identified it as practically the same machine as the one made and used in 1901 (p. 883). He says he never personally did any spot welding on the machine (p. 883).

**Captain William E. Smith**

At the time of giving his testimony, Captain Smith was a captain of Engineers, United States Reserves (Rec., p. 493). His electrical education began when he was employed by the Warren Electric & Specialty Company, in January, 1900 (p. 493). He was employed as an armature winder, but did other work in the fan motor department of the company (p. 495). Brass was used for the manufacture of the fan blades for the season of 1900, but previous to the beginning of the manufacturing season of 1901 a cheap fan was built in which the blades, spiders and guards were constructed of steel (p. 494). Mr. McBerty designed this cheap fan (p. 495).

Witness saw the electric welder that was installed in the fan motor department of the factory, in 1901. This welder was set up to weld the ends of the steel guard rings (p. 495), but it was also used for spot welding steel fan blades to their steel spiders and he saw it so used (p. 495).

Three spot welds were made between each fan blade and spider (p. 496). Some of the blades and spiders were thus welded in January, 1901, soon after the machine was first set up (p. 496).

He saw at least a dozen complete fans in which the fan blades and spiders were spot welded as described (p. 496). The spot welds served the place of rivets (p. 496). He, himself, operated the welder to unite by butt welding the ends of rings or fan guards and by spot welding pieces of steel such as scrap fan blades and other pieces of steel (p. 496). He examined and operated the machine frequently during the fan season of 1901, possibly a hundred times—usually during the lunch hour, that being the time when the machine was not being used by the regular operator (p. 497).

It was the first electric welder he had ever seen (p. 497). He made tests of the strength of the welds and found that the metal would tear out before the welds would yield (p. 500). Upon being shown the welder, Defendant's Exhibit B, he identified it as the machine used by him in 1901. Produces photographs of the welder as now assembled (pp. 500-501) and produces samples of welded work made by him on such machine about a year before his examination (p. 499). He identifies the cuts in the 1901 catalogue, designated G' G' as cuts of the cheap steel-bladed fan referred to (p. 499).

He says when the welder was used in 1901, no secrecy attended its use; it was used openly and any onlooker who came to the factory could see it (p. 502). It was examined by many employees during the lunch hour and its performance as a spot welder was witnessed by them (p. 502).

Witness left the employ of the Warren Electric & Specialty Co., when its fan motor and transformer business was taken over by the Peerless Electric Company in 1902. He then went with the Peerless Company and remained there till January 1, 1905 (p. 503).

After leaving the Peerless Electric Company he went to the Ohio Works of the Carnegie Steel Company, at Youngstown, Ohio, and between February and June, 1905, while at the Carnegie Works, he built for that company an electric welder which was used for uniting pieces of half-inch rod, also for welding overlapping steel plates and for welding together overlapped pieces of resistance ribbon, face to face (pp. 503-504). He produces a blue-print of the welder so built by him for the Carnegie Company and describes the construction of the welder and its manner of use (p. 504). The welding done by the machine was spot welding. He was asked (p. 504):

"Q. 138. Where did you obtain the knowledge from which you were able to make your machine to weld in spots, as you have stated?

A. From work that I had seen done and had done myself on the machine made by F. P. McBerty at the Warren Electric & Specialty Company Factory."

On cross-examination, Mr. Smith testified that the Peerless Electric Company took over the fan motor department of the Warren Electric & Specialty Company about July 1, 1902, and that the welder went with the other effects turned over, but that he never operated the welder after this change, it being placed in a different part of the building from that in which he worked (p. 512).

He named as those who operated the welder in 1901, John Gilder, Curtis Brewer and Charles Elliss (p. 519) and named Mr. McBerty and Mr. Lipps as persons whom he remembered to have seen operating the machine (p. 520).

#### McElray

Mr. McElray is Assistant Chief Superintendent of the Carnegie Steel Company, of Youngstown, Ohio (Rec., p. 908). His testimony is corroborative of the testimony of Captain W. E. Smith, as to the latter's work in the building of spot welding machines at the Carnegie Company's Works in 1905, pursuant to information derived from Mr. McBerty and the latter's welder in 1901.

Mr. McElray says that he helped Mr. Smith build his welder, identifies the blue-print of the machine, Defendant's Exhibit G. Smith Welder, produced by Mr. Smith (*Ibid.*, p. 910). He further says that resistance ribbons, like samples produced, marked Defendant's Exhibit 71, Illustrating Work Done on



Smith Electric Welder were spot welded on this Smith machine in 1905 and the product resulting was put into commercial use in that year (*Ibid.*, p. 911).

### Albertus C. Taylor

Mr. Taylor is at present the Vice-President and General Manager of the Taylor Welder Co., of Warren, Ohio.

Says he first saw an electric welder in May, 1903, at the factory of the Peerless Electric Company, Warren, Ohio (Rec., p. 892). It was the McBerty Welder, Defendant's Exhibit B (*Ibid.*, p. 893). Says he used the machine at the Peerless factory for making butt welds, for welding crossed wires and for welding flat sheets face to face (*Ibid.*, p. 893). He did not use pointed electrodes in the welding of the plates, face to face, but clamped the plates between the copper holding dies themselves to get the pressure on the plates, and then passed current through the dies and plates to produce the weld (*Ibid.*, p. 895). This, of course, was spot welding.

He left the Peerless Company, in 1904 (*Ibid.*, p. 895), and went with the Winfield Electric Welding Company, where from knowledge obtained of the McBerty welder at the Peerless Company, he built, in 1904 (*Ibid.*, p. 895) a spot welder for spot welding metallic white lead kegs and stove pipe elbows.

He also from knowledge of McBerty's work, built spot-welders for the market, in 1906 and 1907, but none were sold till 1908 (*Ibid.*, p. 898), there being difficulty in introducing them, because of distrust of the efficacy of spot welding in those early days.

The spot welders put out by the Winfield Company were the first spot welders ever put on the market by anyone, to the witness' knowledge (*Ibid.*, p. 899).

Mr. Taylor produced sketches illustrating the various welding machines built by him and samples of work illustrating the various applications of spot welding done on these machines.

Mr. Taylor's testimony is of importance because it shows that he, like Capt. W. E. Smith, got his knowledge of the principles of spot welding and of the practical application of those principles from the work of Mr. McBerty and from that knowledge was able to go off and build practical spot welding machines—the first to appear upon the market in this country.

Mr. Taylor, like Capt. Smith, "carried on."

#### Fred G. Carter

Mr. Carter is a machinist now employed at the factory of The Trumbull Steel Company, of Warren, Ohio (Rec., p. 913).

He worked for the Winfield Company in 1904-1905 at the time Mr. Taylor was employed by that company. He remembers the electric welder built by Mr. Taylor, identifies the machine illustrated in the drawing produced by Mr. Taylor (Defendant's Exhibit 69) and recalls the spot welding of strips of sheet steel and of the steel parts of pipe elbows (*Ibid.*, p. 914) by means of that machine.

He himself operated the machine to spot weld.

Other spot welding machines were built at the Winfield factory before he left there in 1907 (*Ibid.*, p. 915) and the product of these machines—stove pipe elbows—was marketed (*Ibid.*, p. 915).

#### William B. Ensor

Mr. Ensor is in the service department of the Peerless Electric Company, at Warren, Ohio. He testifies

that he began working for the Peerless Company in January, 1911 (Rec., p. 954); that soon after he went to work there he found among a collection of old fans and parts in the old stock house, a fan of the Warren Electric & Specialty Company's manufacture, which had a *rivetless* blade.

He was asked (*Ibid.*, p. 955):

"Q. 9. Are you sure that the blade referred to by you was a *rivetless* blade?

A. Oh, yes. No question about it. The blade was a black Japan blade and was perfectly smooth. My attention would not have been called to it if it had rivets in it.

Q. 10. Where in the factory did you see the fan with the rivetless blade?

A. It was on the rack of repairs and returned stuff. This returned goods was in what we now know as the stock room. There was a rack there on which returned goods were put that might be useful for repairs at some future date. These old fans are pretty valuable to us to get repair parts from.

Q. 17. What became of the fan or the rivetless blade, if you know?

A. I don't know, it just disappeared."

It appears from Mr. Ensor's testimony that Newton Smith (an emissary of the plaintiff) had been at the Peerless factory looking for old fans and that witness told him about the old rivetless fan he had seen (p. 956).

It is, of course, only an inference that Newton Smith may have found the rivetless fan in question, and, in some way, have caused it to disappear. He would not be above doing a thing of that sort. It is proven that he is a spy, in the service of the plaintiff, and that, un-

der false representations, he obtained employment as shop superintendent of Mr. McBerty's company, The National Electric Welder Company, and was caught investigating the letters and records of that company, with which he had no business, and, on one occasion, surreptitiously opened the company's safe (Mrs. McBerty, Rec., pp. 976-977; F. P. McBerty, *Ibid.*, p. 889, *et seq.*).

### John B. Estabrook

That the property and stock, including fan motors and fans, of the Warren Electric & Specialty Company, was purchased and taken over by The Peerless Electric Company, in the summer of 1902, is established by the records of the Peerless Company and by the testimony of Mr. John B. Estabrook, the Secretary of the company (Rec., pp. 671-672). This tends to corroborate the story of Mr. Ensor that the rivetless fan of the manufacture of the Warren Electric & Specialty Company was by him, as he testified, found in the old stock house of the Peerless Company and disappeared after Newton A. Smith had been informed of the fact.

### Plaintiff's Unsuccessful Attempts to Answer the McBerty Defense

1. Although knowledge was brought home to counsel for the defendant, in the Barney-Berry case, that Mr. McBerty built and used an electric welding machine in 1901 and did spot welding on it, in that year, not only was the McBerty defense not exploited in that case, but a studied effort seems to have been made to spoil and exclude it, so that it should not be fully available to any one else in any subsequent suit brought on the Harmatta patent.

It appears that, in the fall of 1913, Mr. Clifton V. Edwards, of the firm of Edwards, Sager & Wooster, of New York City, counsel for defendant in the Barney-Berry case, sent one of his assistants, Mr. Thomas Howe, out to Warren, Ohio, to interview Mr. McBerty in regard to his early work in electric welding.

Mr. Howe saw Mr. McBerty and the latter put him in communication with a number of available persons whom Mr. McBerty thought would remember about his work and be willing to give corroborative evidence in regard to it.

Mr. Howe at that time took the affidavits of Mr. McBerty and of quite a number of other persons and secured and annexed to the affidavits specimens of spot-welding identified as having been made on the McBerty welder in the year 1901. Two of these specimens were attached to the affidavit of Mr. McBerty and another to the affidavit of Mr. Lipps, the specimen last referred to having been in Mr. Lipps' possession ever since it was made in 1901. During the cross-examination of Mr. McBerty in this case before Judge Killits these affidavits were produced and offered in evidence by the plaintiff.

Plaintiff now attempts to meet the McBerty defense by contending that, because the defense appears to be better established by the testimony offered in 1919 than it does by the affidavits procured by Mr. Howe, in 1913, the proper deduction to be made is that the additional evidence has been manufactured out of whole cloth for the purposes of this case.

We reply to this, that the testimony and the affidavits agree, in all essential particulars, as to the fact of the building of the welding machine and its use, in 1901, both for butt welding and for spot welding, as well as to its use for the spot welding of steel fan

blades to steel spiders or centers, and the present testimony merely establishes, in addition, a commercial use, on a very small scale, of the spot welded product. It is significant that the affidavits do not state that there was no commercial use.

Mr. McBerty testifies that he did tell his whole story to Mr. Howe before the affidavits were prepared, stating to him that a number of spot-welded fans were completed and went to the trade, and joining him in a search for such fans at the Peerless factory (Rec., pp. 960-961), but that Mr. Howe sought to confine the affidavits to the specimens of spot welding that had been actually preserved and were in hand.

His testimony on the last point is as follows (Rec., p. 966):

“Q. 58. Mr. Howe, in answer to Q. 11, gives the impression that you never told him of making more than one complete fan blade; and didn't tell him any spot welded blades were assembled in complete desk fans that went out to the trade. Have you anything to say about this?

A. Mr. Howe's memory, in connection with this matter, is not good; as that was gone over very thoroughly, in detail, the prior work that had been done on spot welded blades. And his final judgment was, we should confine our testimony in reference to this spot welding on actual samples we had on hand.”

When Mr. McBerty gave his affidavit in 1913, he did not have the 1901 catalogue before him with which to refresh his collection, nor did he have the benefit of a conference with his principal corroborating witnesses, Major E. B. Craft and Captain William E. Smith, who have given such conclusive testimony, in

the presence of the trial court, in this case, and it is not, therefore, at all surprising that his present testimony not only corroborates, but to some extent, supplements, the statements made in the affidavits, without being in conflict therewith.

Another thing must be taken into consideration—Mr. McBerty had been advised, both by his counsel, Mr. McGill (Rec., p. 739), and by his friend, Mr. White (*Ibid.*, p. 888), that it would be dangerous to part with evidence of his early work, as he might never see it again, and he testifies that he did, in fact, hold back and never parted with, to any one, the dated specimen, Defendant's Exhibit M. The wisdom of his having done this is shown by his failure, to this day, to recover the counterpart of Exhibit M, which was delivered into Mr. Edwards' hands, and by the latter, turned over to the plaintiff.

In weighing the statements of the affidavits, the court will give them more or less probative force, accordingly, as it conceives they were prepared by Mr. Howe with the intention of establishing or of *spoiling* the McBerty defense.

It is certain that the affidavits, as they stand, show, beyond question, the fact of the actual practice of spot welding, repeatedly, by Mr. McBerty in 1901, and, that they, taken in connection with the specimens of work actually produced and annexed to the affidavits, fully justified the setting up of the defense in the answer in the Barney-Berry suit, and the calling of witnesses, when that case was tried, to prove that defense. The fact that Mr. McBerty was put upon the stand in that suit, and was then not allowed to tell his story, simply because his priority had not been technically pleaded in the defendant's answer, looks very much like a deliberate and concerted attempt to spoil the defense,

for all time. Both counsel for the plaintiff and counsel for the defendant were aware of Mr. McBerty's claim to priority, and of the available evidence to support it before that suit was tried.

Once we get the notion that the Barney-Berry suit was not fully defended, but, by preconcert, was fought softly, to say the least, we can well understand how the affidavits taken by Mr. Howe may have been artfully framed to satisfy Mr. McBerty and yet lend color to the argument of abandoned experiment by a studied failure to include anything looking like the commercial use of spot welding by Mr. McBerty.

2. When Mr. McBerty testified before the court in this case that the 1901 and the 1902 catalogues contained illustrations of the "ironclad" G-2 fan, and told the court that such illustrations were made from a photograph of one of the actual spot welded fans, and pointed out that, whereas, in all the other illustrations of fans to be found in those catalogues, the rivets employed to connect the fan blades to their spiders were shown, and further identified the cut in the "American Electrician" of March, 1901, as illustrating also the spot welded G-2 fan,—plaintiff felt the force of the blow and set about to try to discredit the illustrations.

To that end, plaintiff called a photographer, Mr. Wilbur F. Turner (Rec., p. 306), who testified that it would be easy to photograph a fan whose blades had been riveted, and then prepare the negative so that the rivets would not show in a positive printed from the negative, and that, in his judgment, was precisely what had been done to the negative taken of the G-2 fan, the photographer having failed to put back the rivets in the negative, as had been done, it was claimed, in the case of the other photographic illustrations shown in the catalogues!



Of course, nobody ever doubted that a photographic negative could be so manipulated as to not truly represent the object photographed; but it is certainly a strain upon one's credulity to believe that this particular kind of alteration was made, back in 1901, on the negative of this particular critical, G-2 fan, whose identity, as a rivetless fan is so well established by evidence outside the photograph.

We think the court will accept the straightforward testimony of Mr. McBerty and his witnesses to the fact that the fan was a rivetless fan and that the illustration correctly portrays it, rather than the expert testimony of this willing photographer, procured to testify eighteen years after the event to meet a serious exigency.

3. Another attack made upon Mr. McBerty's evidence was made through the deposition of Mr. Richard L. Binder, of Philadelphia, and through Mr. James H. Gravell plaintiff's stop-gap, in the latter's fifth and sixth depositions.

Mr. Gravell, in his fifth deposition (Rec., p. 361) took great satisfaction in pointing out that the specimen of fan blade and spider, Defendant's Exhibit M, introduced by Mr. McBerty as a specimen of spot welding done by him in 1901, showed two (2) rivet holes and that illustrations of fans having two (2) rivets were not to be found in any of the catalogues or trade illustrations of Peerless fans until the year 1909, and that in the issue of the "Electrical World" of March 4, 1909, the blades of the Peerless fans were first shown as having been attached by two (2) rivets each. The deduction, of course, sought to be drawn from all this was that Defendant's Exhibit M, and all other specimens produced by Mr. McBerty that

showed a two-rivet connection, were faked and were really made from parts first used in the manufacture of the Peerless fans in 1909.

In an attempt to make this point stronger, Mr. Gravell, in his sixth deposition (Rec., p. 382) testified that he had found at the J. B. Shannon Hardware Company's store, in Philadelphia, an old fan (Plaintiff's Exhibit 51, Fan Purchased by Gravell), corresponding as to base, standard and other parts to the G fans illustrated in the 1901-1902 catalogues, and Mr. Binder, in his testimony, attempted to identify this fan as a sample of the cheap fan like those put out by the Warren Electric & Specialty Company, somewhere around 1901-1902 (Rec., p. 385), which had the blades and spider arms attached by three rivets, instead of by two rivets, the spider being a cast brass spider and the blades being of steel (*Ibid.*, p. 383). This was supposed to be further proof that the Warren Electric & Specialty Company had never made any two rivet fan blade connections, especially two-rivet connections for uniting steel blades to steel spiders, as early as 1901.

But this latest attempt to discredit the testimony of Mr. McBerty and his corroborating witnesses was completely annihilated by defendant's proving, on rebuttal, from the records of the Peerless Electric Company, the successor of the Warren Electric & Specialty Company, that, for the season of 1901, the Warren Electric & Specialty Company issued and sent out to the trade four separate printed illustrated bulletins, namely,—

(a) Bulletin No. 1, illustrating fan A-2 having cast brass center and three (3) rivets per blade;

(b) Bulletin No. 2, illustrating fan A-6, showing stamped steel center and two (2) rivets per blade;

(c) Bulletin No. 3, illustrating fan E-2 having cast brass center and three (3) rivets per blade; and

(d) Bulletin No. 4, illustrating fan G-2 with stamped steel center and blades spot welded thereto, the illustration of this last bulletin being like the illustration of the G-2 fan in the catalogue of 1901 and 1902, and showing a rivetless fan.

Mr. McBerty testified to the character of the fan blades and spiders shown in these several exhibits (Rec., p. 1010), and Mr. George B. Sawyer, of the Peerless Electric Company, testified (*Ibid.*, p. 1007) that the scrap book containing the exhibit bulletins referred to by Mr. McBerty was produced from the archives of the Peerless Company and was a book with which he was familiar while he was employed by the Warren Electric & Specialty Company during the years 1901-2.

Mr. McBerty further testified that the spider and fan blades on Plaintiff's Exhibit No. 51 were not on the fan as originally put out, but represent some vagrant spider and blades that had been attached to the shaft of the fan at some later period, and that the rivets shown on the blades of the exhibit are machine headed, whereas the Warren Electric & Specialty Co. had no riveting machine in 1901-2 (Rec., p. 1013). He further testifies that the shafts of various desk fans are of the same diameter and are so built to accommodate any fan spider. It appears, therefore, that these attacks of the plaintiff upon the integrity of the testimony of Mr. McBerty and his witnesses in regard to the G-2 fans have reacted upon the plaintiff and have had the effect of materially strengthening the defendant's case.

On the whole, the evidence is satisfactory and con-

clusive (1) that there was practiced the method and (2) that there was made the product of the Harmatta patent, by Mr. McBerty, in the year 1901.

The practice of the method could, of course, only be proved by the testimony of those who practiced it or saw it practiced. Such proof has been adduced. The machine by which the method was practiced has been preserved and is in Court and has been fully identified by many witnesses. The spot-welded products or articles resulting from the practice of the method, by means of the machine, are in Court—several samples of them—and their identity has been fully established by witnesses of the highest standing. The defendant could do no more. It has satisfied the requirements in such cases.

The number of times the method was practiced and the number of times the product was produced is quite immaterial. A single, well authenticated instance of the practice of an invention has many times been decided, by highest authority, to be sufficient to defeat a patent.

In *Egbert vs. Lippman*, 104 U. S., 333, it appears that Barnes, the patentee, made a set of corset steels and presented them to his fiance, who wore them for more than two years prior to the application for his patent. Proof of this fact, invoked the following language from the Court:

“We observe, in the first place, that to constitute the public use of an invention it is not necessary that more than one of the patented articles should be publicly used. The use of a great number may tend to strengthen the proof, but *one* well defined case of such use is just as effectual to annul the patent as many” (citing cases).

Coffin vs. Ogden, 18 Wallace, 120, is to the same effect. In that case, in a suit for infringement of a lock patent, defendants pleaded the manufacture and use, by one Erbe, of a lock embodying all the attributes of complainants. It was proven that Erbe made but three of such locks, one of which was in evidence; but the proof was convincing as to the fact of his having made *a lock* of the type under discussion. The Court said (p. 124):

“The invention or discovery relied upon as a defense must have been complete, and capable of producing the result sought to be accomplished; and this must be shown by the defendant. The burden of proof rests upon him, and every reasonable doubt resolved against him. If the thing were embryonic or inchoate; if it rests in speculation or experiment; if the process pursued for its development has failed to reach the point of consummation; it cannot avail to defeat a patent founded upon a discovery or invention which was completed, while in the other case there was only progress, however near the progress may have approximated to the end in view. The law requires not conjecture, but certainty. If the question relate to a machine, the conception must have been clothed in substantial forms which demonstrate at once its practical efficacy and utility. The prior knowledge and use of a *single person* is sufficient.

The number is immaterial.”

In Brush vs. Condit, 132 U. S., 39, the Brush patent for improvement in electric lamps was sued upon and the use of a single lamp made by one Hayes for more than two years prior to the application, was set up as a bar. It appears that Hayes made but one lamp, which was used in and about the mill of Wallace &

Sons, in the ordinary way. Justice Blatchford, in expressing the opinion of the Court that this was a sufficient public use, said:

“The case is that of the public, well known, practical use, in ordinary work, with as much success as was reasonable to expect at that stage in the development of the mechanism belonging to electric arc lighting, of the exact invention which was subsequently made by the patentee, and, although only one clamp and one lamp were ever made, which were used together two and one-half months only, and the invention was then taken from the lamp and was not afterwards used with carbon pencils, it was an anticipation of the patented device under the established rules upon the subject \* \* \*.”

The Court of Appeals for the Seventh Circuit held, in *U. S. Mineral Wool Co. vs. Manville Covering Co.*, 125 Fed., 770, that the practice of a process for producing wool, on two separate occasions, and no more, invalidated a patent for such process, though it appeared that no efforts were made to further use the process. Judge Baker, speaking for the Court, said:

“If the patent is not void for indefiniteness (citing cases), we think the process was anticipated by the prior use at Joliet. What Pettigrew and Gleason did was not an abandoned experiment. They knew the product they wanted to get. They experimented with hardened slag alone unsuccessfully \* \* \*. The process they discovered in 1884 did not lapse into a lost art. In 1886 they used it in successful manufacture. Why the Illinois Steel Co. did not have them continue is not clear, but they were not the masters. Nevertheless, whenever they have been called upon since 1884 to explain the process they have done

so. The use was not secret. The process was practiced by Pettigrew and Gleason and those who assisted and was open to the observation of the employes generally and of all who passed through the plant. We think there was abundant publicity. *Coffin vs. Ogden*, 18 Wall., 120; *Brush vs. Condit*, 132 U. S., 39."

This case was tried in open court and the McBerty defense exploited in the presence of the Judge.

In its opinion the trial court said:

(*Rec.*, pp. 40-41).

"We have seen the witnesses as they spoke on the stand. The naturalness of their stories suggests want of co-operation. They corroborate each other in the varying scopes of their experiences with Exhibit B. Their testimonies are to such important things that, if unreliable in substance, there is no escape but to assign willful perjury as the cause by a number of men whose credibility is not subject to attack from anything that appeared before us.

The testimony of Smith, Craft, Powers, Gilder, McDonald, Taylor and Ensor and Brown (by affidavit) is all perjured—every one of these men, as well as Lipps and McBerty, is foresworn—if this allegation of prior use is substantially untrue. Perjury is unthinkable with such men as these men appear to be. Besides, their stories have in them no element of the unusual or unexpected. What they say McBerty did in 1901 is just what we can see one interested in the matter might readily do in due course of satisfying his interest. The incident was a logical step, plainly indicated in the condition of the prior art."

The conclusiveness of the findings of fact of the trial judge is upheld by the great weight of authority.

We give below citations from opinions of this Court and of the various Circuit Courts of Appeals on the subject:

### Supreme Court Cases

"A special finding by the court upon issues of fact, where the parties or their attorneys have duly filed a stipulation, waiving a jury, has the same effect as a verdict, and is not subject to review by this court except as to the sufficiency of the facts found to support the judgment."

*Tyng v. Grinnell*, 92 U. S., 467.

"Where a case is tried by the Circuit Court without a jury, and it makes a special finding of facts, with conclusions of law, alleged errors of fact are not, on a writ of error, subject to revision by this court, if there was any evidence on which such findings could be made."

*Hathaway v. First Nat. Bank*, 134 U. S., 494.

"Where a case is tried by the court, a jury having been waived, its findings upon questions of fact are conclusive in the courts of review."

*Dooley v. Pease*, 180 U. S., 126.

"Under R. S. Secs. 649, 700 and 1011, findings of fact have the same effect as the verdict of a jury, and this court does not revise them but merely determines whether they support the judgment."

*U. S. v. Fidelity Co.*, 236 U. S., 512.

"The rule which gives conclusive effect to a finding made by a judge who saw the witnesses, when there is testimony consistent with it and the finding depends on conflicting testimony or the credibility of witnesses, is peculiarly applicable in a case wherein a patent is assailed by oral evidence of an alleged unpatented anticipation."

*Adamson v. Gilliland*, 242 U. S., 350.

See also *Wiscart v. D'Anchy*, 3 How., 320.



## Circuit Court of Appeals Cases:

## FIRST CIRCUIT.

"He (the trial judge) had so much better opportunity than this court to judge correctly the accuracy and credibility of the various witnesses that, on familiar and established principles, his conclusions will not be disturbed unless they are clearly wrong."

*Fuller v. Reed*, 249 Fed., 158.

## SECOND CIRCUIT.

"The testimony is not direct, but is circumstantial, and somewhat conflicting \* \* \*. But on examination of the record it appears that there is credible testimony which supports the findings of the court below \* \* \* and we think that finding is under all circumstances conclusive upon this court on this appeal."

*Pierce v. Dock Co.*, 265 Fed., 148, 153.

"We must, therefore, accord to the findings of fact, in a case tried to the court without a jury, there being a stipulation in writing waiving the jury, the same effect as we would give a verdict."

*Nashville Co. v. Barnum*, 212 Fed., 634, 639.

"We should not reverse his finding upon a mere pure question of fact, where the evidence justifies the finding, even if we might have reached a different conclusion upon the evidence."

*Brookheim v. Greenbaum*, 225 Fed., 763, 764.

## THIRD CIRCUIT.

"By stipulation a jury was waived and the case tried by the judge. He found a verdict for the plaintiff \* \* \*. Where, as here, a case is tried by a judge, the findings of fact by a court are conclusive, unless there is no evidence to sup-

port them. *Hathaway v. First Nat. Bank*, 134 U. S., 494."

*Washington Co. v. Murray*, 211 Fed., 440, 447.

"By stipulation, under R. S. 649, the parties waived trial by jury. The findings of the judge, under the statutory submission, having the effect of a verdict (*Lehnan v. Dickson*, 148 U. S., 71), the first question arises: Was there competent evidence on which to base the finding that Peet's account was overdrawn?"

*Elliott v. Peet*, 202 Fed., 434, 436.

#### FOURTH CIRCUIT.

"Every finding of fact made by the District Court, having reasonable support in the evidence and tending to support the judgment, is binding on this court."

*Virginia Co. v. Charles*, 254 Fed., 379, 382.

"It is familiar doctrine that the findings of the trial court in an equity case are presumptively correct, and will not be set aside by an appellate tribunal, unless they are based upon an obvious error of law or a serious mistake in dealing with the facts."

*McKeithan Co. v. Fidelity Co.*, 233 Fed., 773, 774.

#### FIFTH CIRCUIT.

"Where jury was waived and all matters submitted to the judge, his findings on issues of facts are, at least, entitled to as much consideration as a verdict and so will not be disturbed on appeal, if there was evidence furnishing a basis therefor."

*Bain v. White*, 256 Fed., 428.

## SIXTH CIRCUIT.

"It is settled that an appellate court of the United States does not weigh the evidence."

*Barber Co. v. Brown Mach. Co.*, 258 Fed., 1, 3.

"Counsel seem to overlook the rule that a federal appellate court does not weigh the evidence, though, of course, the court must be satisfied, as we are here, that there is proper evidence which in law is sufficient to support the verdict."

*Lake Erie Co. v. Schneider*, 257 Fed., 675, 679.

"The entire testimony in the case, except Rich, who did not attend the conference, was taken in open court. There was express testimony supporting the court's conclusion; and this conclusion we are bound to accept, unless the evidence preponderates against it."

*Escanaba Co. v. Burns*, 257 Fed., 898, 901.

"We are disposed to treat this as a special finding, though, whether general or special, it has the effect of the verdict of a jury. Hence the only inquiries open to this court are \* \* \* whether the evidence tends to support the ultimate findings \* \* \*. This results from the statutes and the decisions, Sees. 649, 700 and 1011, R. S. U. S.; *Morris v. Jackson*, 76 U. S., 125; *Runkle v. Burnham*, 153 Fed., 216; *U. S. v. U. S. Fidelity Co.*, 236 U. S., 512; *Chicago Co. v. Barrett*, 190 Fed., 118 (CCA 6); *Mason v. Smith*, 191 Fed., 502 (CCA 6)."

*Turner v. Schaeffer*, 249 Fed., 654, 656.

"Not only must we apply the familiar rule that we will not overturn the fact findings of the trial judge, save in a very clear case \* \* \*."

*King v. Weiss Co.*, 266 Fed., 257, 259.

"Where the trial court has seen and heard the witnesses, we are always reluctant to set aside its finding of fact."

*City of Toledo v. Toledo Co.*, 259 Fed., 450, 453.

"In accordance with our settled practice we must give great weight to the conclusions of the trial judge. If Mr. and Mrs. Snodgrass told the truth in their testimony, the petitioner has no case. Their veracity was the controlling question, and this may be so far judged by their manner and by the atmosphere, which cannot be reproduced in the printed record, that only when 'there is a decided preponderance against the judgment' will an appellate court reverse such a decree. *Cleveland v. Chisholm*, 90 Fed., 431, 434 (CCA 6); *Monongahela v. Schinnerer*, 196 Fed., 375 (CCA 6)."

*Pugh v. Snodgrass*, 209 Fed., 325, 326.

"The trial judge had the advantage of seeing and hearing all the witnesses except the bankrupt; and every experienced lawyer knows what that means. While equal advantage exists here as respects the deposition of the bankrupt, yet this is not so as to the testimony of appellant; the important element of demeanor of the witness, like that of every other witness who testified before the Court is, of course lacking.

Indeed, the rule in such circumstances is not to disturb the judgment of a district court unless it is overborne by the clear weight of the evidence as disclosed by the record (citing cases)."

*Carey v. Donohue*, 209 Fed., 328, 333.

"Where an action at law is by stipulation tried to the Court without a jury under R. S. U. S., 649 and 700, the findings of fact made by the court are not reviewable by an appellate court, if there is any competent evidence on which they could have been made."

*Chautauqua Inst. v. Zimmerman*, 233 Fed., 371.

"Findings of fact by the trial judge in an equity case will not be disturbed on appeal, unless the evidence preponderates against them."

*Estep v. Kentland Co.*, 239 Fed., 617.

#### SEVENTH CIRCUIT.

"As the trial judge saw and heard the witnesses, his findings upon the issues of fact will not be set aside, unless the cold type of the record demonstrates that a material finding was either unsupported by evidence or was made in the face of a clearly ascertainable preponderance to the contrary."

*Aetna Co. v. Davidson Co.*, 257 Fed., 68.

"The court heard the evidence of the witnesses, and had before it the alleged infringing devices \* \* \*. The evidence of the witnesses is contradictory, and in so far as the decree is predicated thereon, we cannot disturb it."

*Blettner v. Gill*, 251 Fed., 81, 82.

"It is true the weight of this testimony is somewhat shaken by other evidence. \* \* \* But the weight of his testimony was for the District Judge to determine."

*Deister Co. v. Deister Mach. Co.*, 263 Fed., 706, 709.

"The rule is that a finding of the trial court on an issue of fact will not be disturbed on review, unless the finding is clearly against the weight of the evidence."

*Winter v. Bostwick*, 212 Fed., 884, 887.

"The facts found by the chancellor will be presumed correct, unless the record shows an egregious blunder in the consideration of the evidence, or an error in the application of the law, resulting in manifest injustice" (citing cases).

"The pertinent issue of fact was determined solely upon the testimony of James R. McKay, and counsel urges that the foregoing rule applies only where there is a conflict in the evidence. This is not so. The evidentiary facts may all be made known from the mouth of a single witness, and yet the ultimate fact as determined by the chancellor is just as persuasive as if the evidentiary facts had come from many witnesses."

*Weld v. McKay*, 218 Fed., 807, 809.

#### EIGHTH CIRCUIT.

"Unless we are to completely disregard the rule that the finding and decree of a chancellor, who has heard the witnesses, will not be disturbed, except in a clear case, the decree ought to be affirmed."

*Hamlin v. Grogan*, 257 Fed., 59, 60.

"It was said in *Adamson v. Gilliland*, 242 U. S., 350, that a patent case is preeminently one for the application of the practical rule that so far as the finding of the master or judge who saw the witnesses depends upon conflicting testimony, or upon the credibility of witnesses, or so far as there is any testimony consistent with the finding, it must be treated as unassailable."

*Fed. Co. v. Pick & Co.*, 251 Fed., 894.

"On this appeal the controversy is purely one of fact. The questions raised are: First, was the court below wrong in holding that the deed from Barnes to Bates was genuine \* \* \* ?

To secure a reversal upon such a basis as that just mentioned the appellant must convince us not only that the trial court may have been wrong, but that it was manifestly wrong. There must, under the holdings of this court, have been an 'obvious error' of law or a 'serious mistake' in dealing with the facts. (Cases cited.) The error

must be 'clear and palpable.' *Babcock v. De Mott*, 160 Fed., 882. The conclusion of the trial court is presumptively right. Some distinction relieving from this rule is claimed in the present case because the testimony was not taken before the judge but before an examiner, and it is said that under such circumstances this court is in as favorable a situation to deal with the matter as was the court below. *U. S. v. Booth Co.*, 203 Fed., 423 (this circuit) is cited to this point. But the question is not so much one of situation to decide as of where the law places the primary determination of questions of fact. While no doubt the circumstances that the district judge personally heard the witnesses tends to strengthen the presumption in favor of his conclusions—a consideration mentioned by this court in *Coder v. McPherson*, 152 Fed., 951 and *Harper v. Taylor*, *supra*, by the Circuit Court of Appeals for the Sixth Circuit in *Mt. Vernon Co. v. Wolf Co.*, 188 Fed., 164,—the fact that he did not hear such witnesses, but that the proofs before him were entirely by deposition or upon examiner's report, does not destroy the presumption. Such still exists in favor of his conclusion. To hold otherwise would be to make this the court of first instance. The District Court is not in such matters a mere conduit. Our functions are simply to guard against manifest error on its part, and this is true whether such arises upon hearing witnesses or upon reading a record."

*U. S. v. Marshall*, 210 Fed., 595, 597.

"When an action at law is tried without a jury by a federal court, and it makes a general finding, or a special finding of facts, the act of Congress forbids a reversal by the appellate court of that finding, or the judgment thereon, 'for any error of fact' (R. S. U. S., Sec. 1011), and a finding of fact contrary to the weight of the evidence is an error of fact."

*Wear v. Imperial Co.*, 224 Fed., 60, 63.

"The rule is firmly established by the Supreme Court and has been repeatedly applied by this Court: That where the chancellor has considered conflicting testimony, made his findings and decree thereon, they will be held by the appellate courts to be presumptively correct, and unless an obvious error has intervened in the application of the law, or some serious mistake has been made in the consideration of the evidence, the findings must stand." (Cases cited.)

*Nichols v. Elken*, 225 Fed., 689, 692.

#### NINTH CIRCUIT.

"The trial court held there was no infringement of the patent in suit.

In such a case, the trial court having the advantage of seeing and especially examining the material which it is claimed infringes, an appellate court, without such advantages, will not disturb the conclusions reached, unless it appears clearly that the finding is against the obvious weight of the testimony."

*Diamond Co. v. Webster Bros.*, 249 Fed., 155 158.

"That conclusion was sustained by direct testimony which the court below credited, and we regard it as binding on this court."

*Hathaway v. Ford Motor Co.*, 264 Fed., 952, 954.

"Allegations of fact made in defense of the action \* \* \* were negatived by the findings of the trial court, and under the well established rule such findings are conclusive upon us, however convincing we might otherwise consider the argument of plaintiff in error that upon the evidence such findings should have been otherwise. *Tyng v. Grinnell*, 92 U. S., 467; *Dooley v. Pease*, 180 U. S., 126."

*Nat. Surety Co. v. Globe Co.*, 256 Fed., 601, 602.



"The findings of fact are all based upon evidence which is conflicting, and which was taken in open court, and they will not be disturbed by this court, in the absence of a showing that in arriving at the same, the court below erroneously applied some rule of evidence or found contrary to the decided weight of the testimony."

*Leggat v. M'Lure*, 234 Fed., 620, 621.

### CONCLUSIONS

It is respectfully submitted that a careful examination of the record in this case will justify the Court in reaching the following conclusions, among others:

1. That Johann Harmatta contributed nothing new to the art of electric resistance-welding, but that everything that he disclosed by way of method or of product, was known to and disclosed by others prior to the date of his alleged invention.
2. That the Harmatta patent, as to all of its claims, is anticipated by the work of Adolph Rietzel, conducted in the factory of plaintiff's predecessor, long prior to the date of Harmatta's alleged invention.
3. That the plaintiff is estopped to deny Rietzel's priority over Harmatta.
4. That the Harmatta patent, as to all of its claims, is anticipated by the prior work of F. P. McBerty, at Warren, Ohio, in the year 1901.
5. That the Harmatta patent is invalidated by the proven prior invention of Sebastian Ziani de Ferranti, in May, 1903.
6. That the Harmatta patent is invalid as to all of its claims, because Harmatta never made the statutory oath to any of such claims.
7. That the Harmatta patent is invalid because the delay in its grant was first employed to enable the

plaintiff to retain the dominance of the Rietzel patent, for the same invention, and, then, to secure a belated second patent, which had the effect of prolonging plaintiff's protection to twenty years, instead of limiting it to the statutory period of seventeen years.

8. That the adjudication in the Barney-Berry suit is so discredited as to entitle it to little or no weight, favorable to the plaintiff, in the determination of this cause.

9. That the conduct of the plaintiff and its predecessor has generally been so devious and inequitable as to disentitle it to the favorable consideration of a court of equity.

10. That the decree of the court below was right and should be affirmed.

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November 3, 1923.